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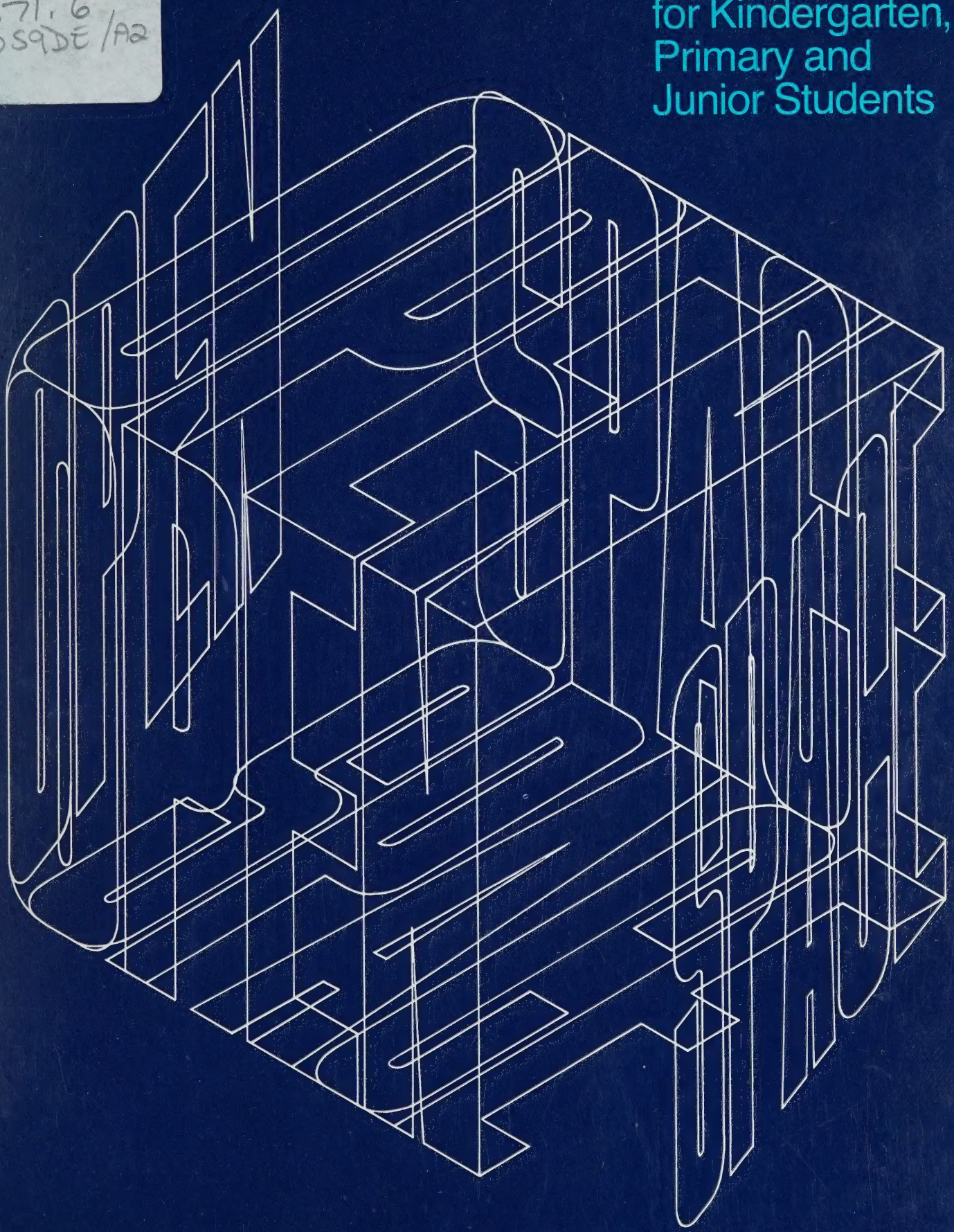
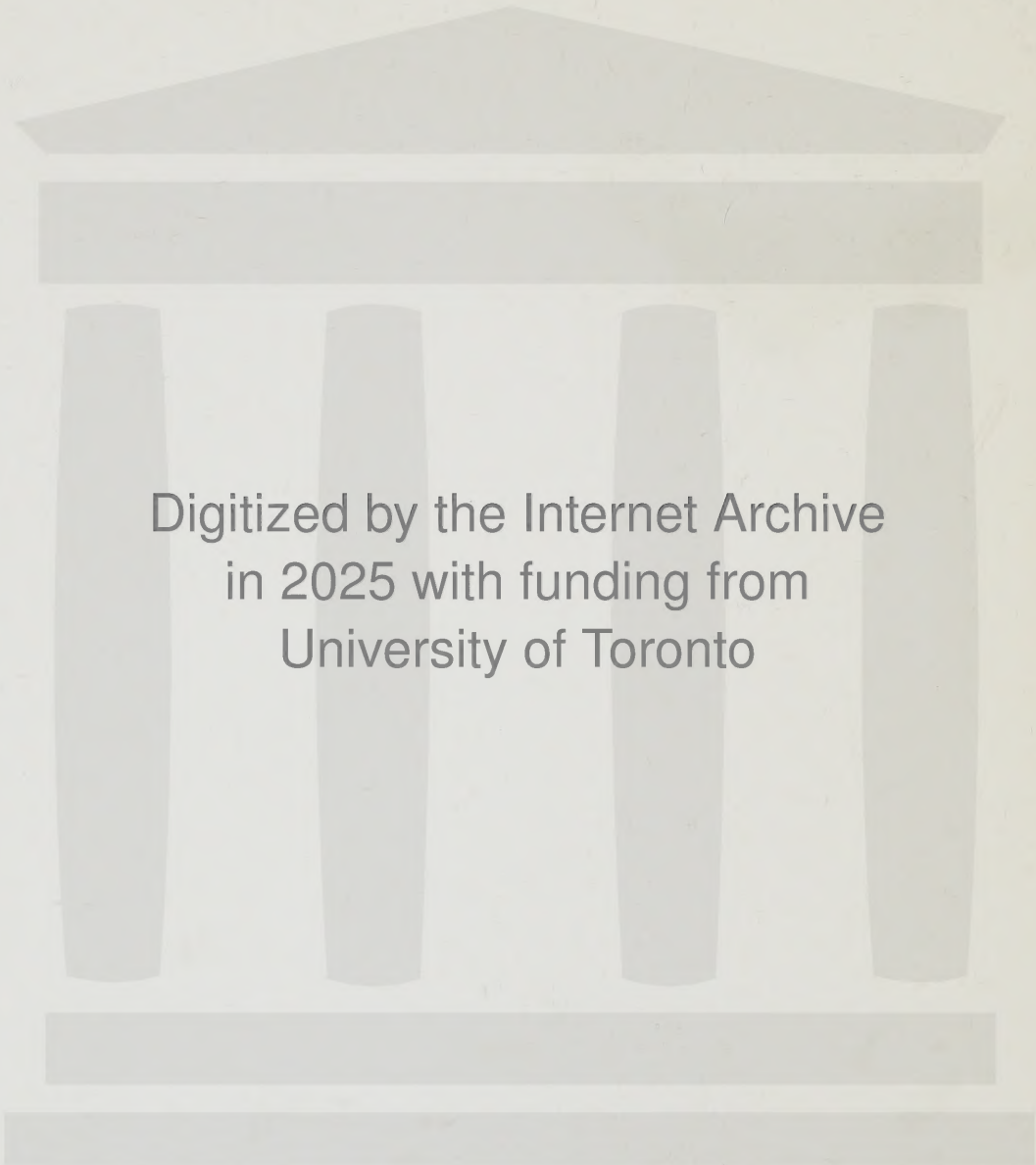
Open Space General Learning Facilities

for Kindergarten, Primary and Junior Students

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Open Space General Learning Facilities

for Kindergarten, Primary and Junior Students

Prepared by
School Planning and Building
Research
In conjunction with the Departmental
General Learning Facilities Committee

November, 1971

Architectural Services of the
School Business Administration Branch
Ontario Department of Education

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Contents

4 Introduction

5 Kindergarten

Indoor Facilities
Outdoor Area
Suggested Layouts
Sketches

25 Primary and Junior General Learning Facilities

Learning Facilities
Teachers' Planning Area
Wet Area
Seminar Area
Environmental Criteria
Suggested Layouts
Sketches

Introduction

Generally, an elementary school consists of two main functional elements:

- Learning areas, which include all spaces where teaching and learning take place, such as general learning areas (classrooms) and specialized areas, such as art, music, library resource centre, science, and gymnasium.
- Administrative areas, which include administration offices and staff facilities.

This publication concerns itself with the general learning facilities (classrooms) of the school. It is hoped that the suggestions made will be of assistance to those involved in planning kindergarten areas and open space general learning facilities for the primary and junior divisions.

Kindergarten

Indoor Facilities

Location

To achieve continuous progress, an integrated curriculum, and co-operative teaching, it is recommended that the kindergarten form part of the general learning facilities or be adjacent to them.

For safe and easy access, and to facilitate use of the outdoor area, the kindergarten should have its own entrance.

Direct access to the general learning area and library resource centre is desirable.

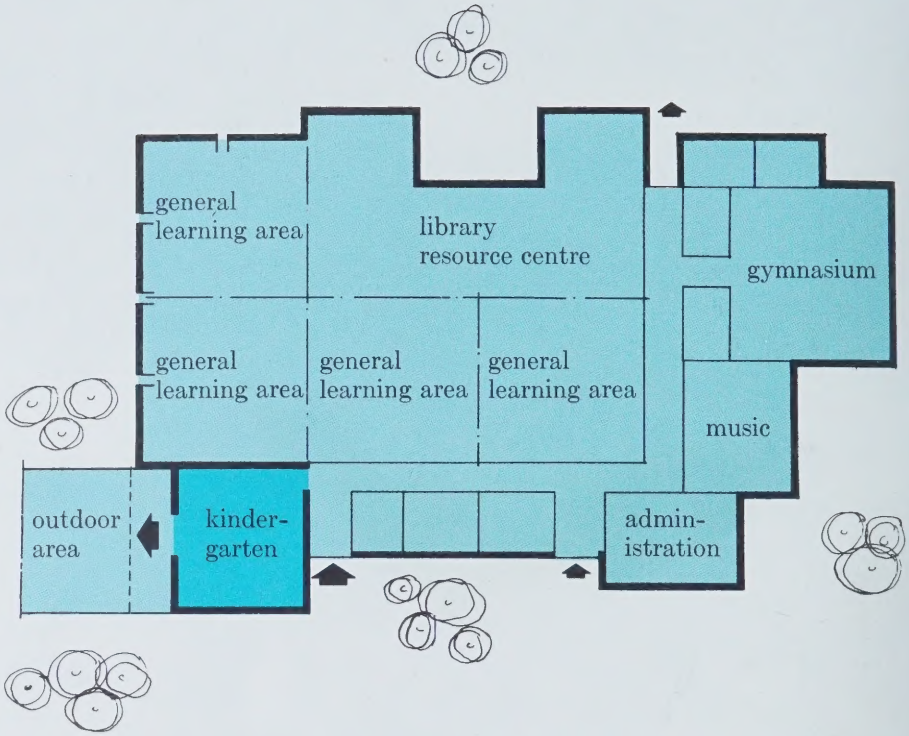
Size

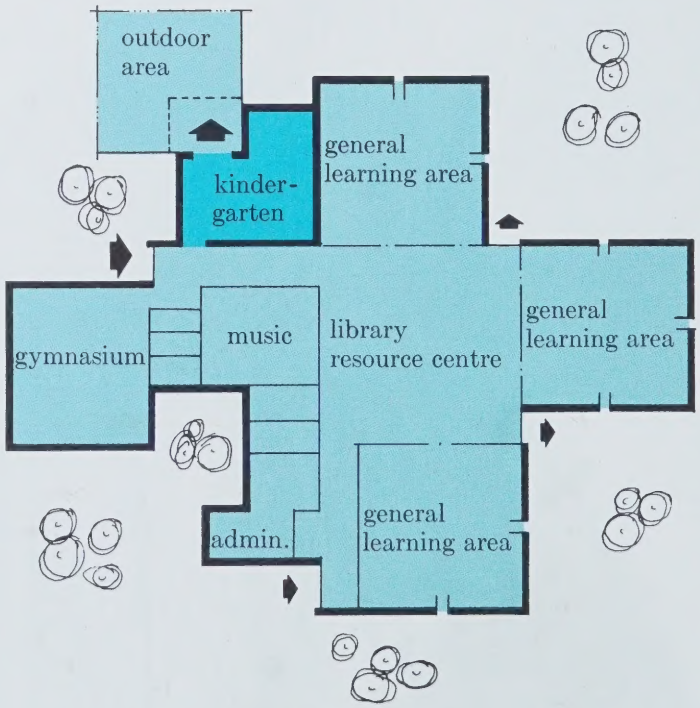
To accommodate the average kindergarten class of 20 pupils, the kindergarten area should occupy a space of not less than 700 sq. ft. (excluding entrance, storage, cloakroom, and washroom space).

Should a local educational program require a functional floor area greater than 700 sq. ft., the Capital Grant Plan of the Department of Education should be consulted.

Shape

Square or rectangular rooms are generally preferred, as they facilitate flexibility of activity and ease of supervision. L-shaped rooms are also suitable, for while one corner of the L is being used for a specific activity, the rest of the area is available for a diversity of activities.





Requirements

Flooring

Different activities require different floor finishes. Activities such as story-telling and reading, which call for maximum comfort, and also those that do not involve stain-producing materials require carpeting that can be relocated as required. Activities such as painting and drawing require a washable, hard surface covering.

Walls

All factors pertinent to the use of the wall area between the heights of 2 ft. and door level need to be considered together. These would include pin-up areas for pictures and notices, drawing surfaces for the children, and chalkboard surfaces for teacher demonstration and the children's use.

Chalkboards and Tackboards

It is recommended that these be constructed at different levels — one level for children's use and one level for adult use. The pull-down type can serve this purpose. At least 25 to 30 linear feet of chalkboard should be provided.

Furniture

Movable tables, rather than individual desks, should be provided, as children now work more often in groups. The furniture should be scaled to the user's size.

Storage

The kindergarten should include a work counter with sink and adjustable storage units — both fixed and movable — to accommodate the great variety of materials and tools used by the children.

A movable storage/display unit can fulfil several purposes. These include: use as a work surface; storage compartments; display surface on one side and chalkboard on the reverse side; use as a mobile space divider.

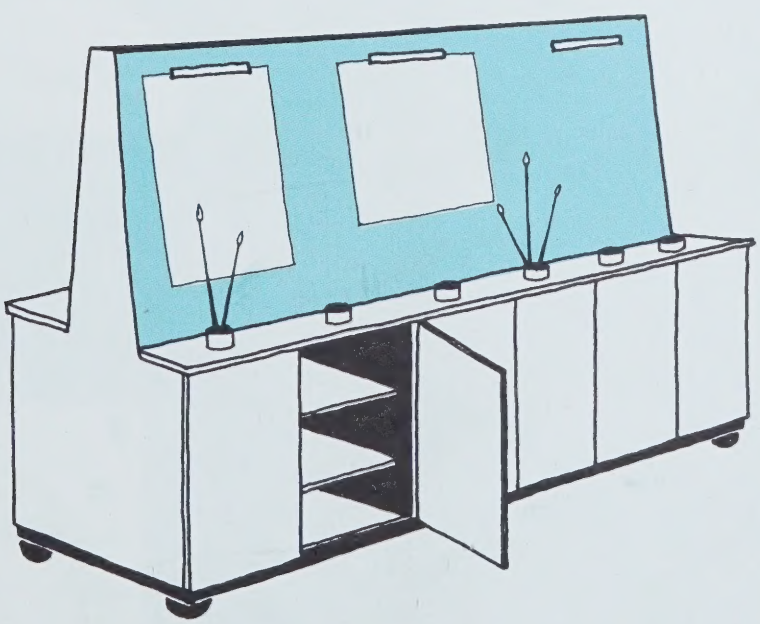
Environmental Aspects

Lighting in sufficient quantity and of good quality is necessary. The illumination provided should prevent glare or shadow.

As children use the floor for sitting and as a work surface, draught-free floors are mandatory.

The temperature and relative humidity within the space should be maintained at a comfortable level.

Room colours should be carefully selected to create a stimulating environment.



movable storage/display unit

Outdoor Area

This area is provided for the use of the kindergarten pupils only. Separation and screening from other facilities can be achieved with landscaping.

Extension of the kindergarten roof can provide a partially covered outdoor area. The direction of the prevailing wind should be taken into consideration in deciding the location and design of the outdoor area so that wind tunnel effects and undesirable wind buffeting may be avoided.

The area should include grassed and paved areas. These will permit children to experiment with games on a variety of surfaces.

There should be mounds or abrupt rises at the edge of the area. A number of sturdy shrubs and trees would be extremely desirable. A wading pool might also be provided.

Sand Play

A sand pit should be included. Activities involving digging and filling holes or mixing sand and water are extremely popular with children.

Adventure Play

Use of this playground demands planning, initiative, skill, co-operation, and work on the part of the children. Socially, it creates circumstances in which the children are called upon to manipulate their own situation rather than follow preconstructed models.

The designer should make imaginative use of natural topographic features or create artificial slopes and mounds. A wide variety of simple building elements can be used — bricks, concrete blocks, scrap lumber of various dimensions, bolts, pipes, small concrete viaducts. However, these objects must not be too complicated or dangerous.

Climbing-frames and similar equipment are frequently used, but must be placed on soft ground to cushion accidental falls. Swings are extremely popular, but should be placed with care to minimize the possibility of children wandering accidentally into their path.

Storage space is required for the tools and small play equipment used in this area.

wash room
Kindergarten
wet area
sand pit
Outdoor Area
sunken area
Covered Area

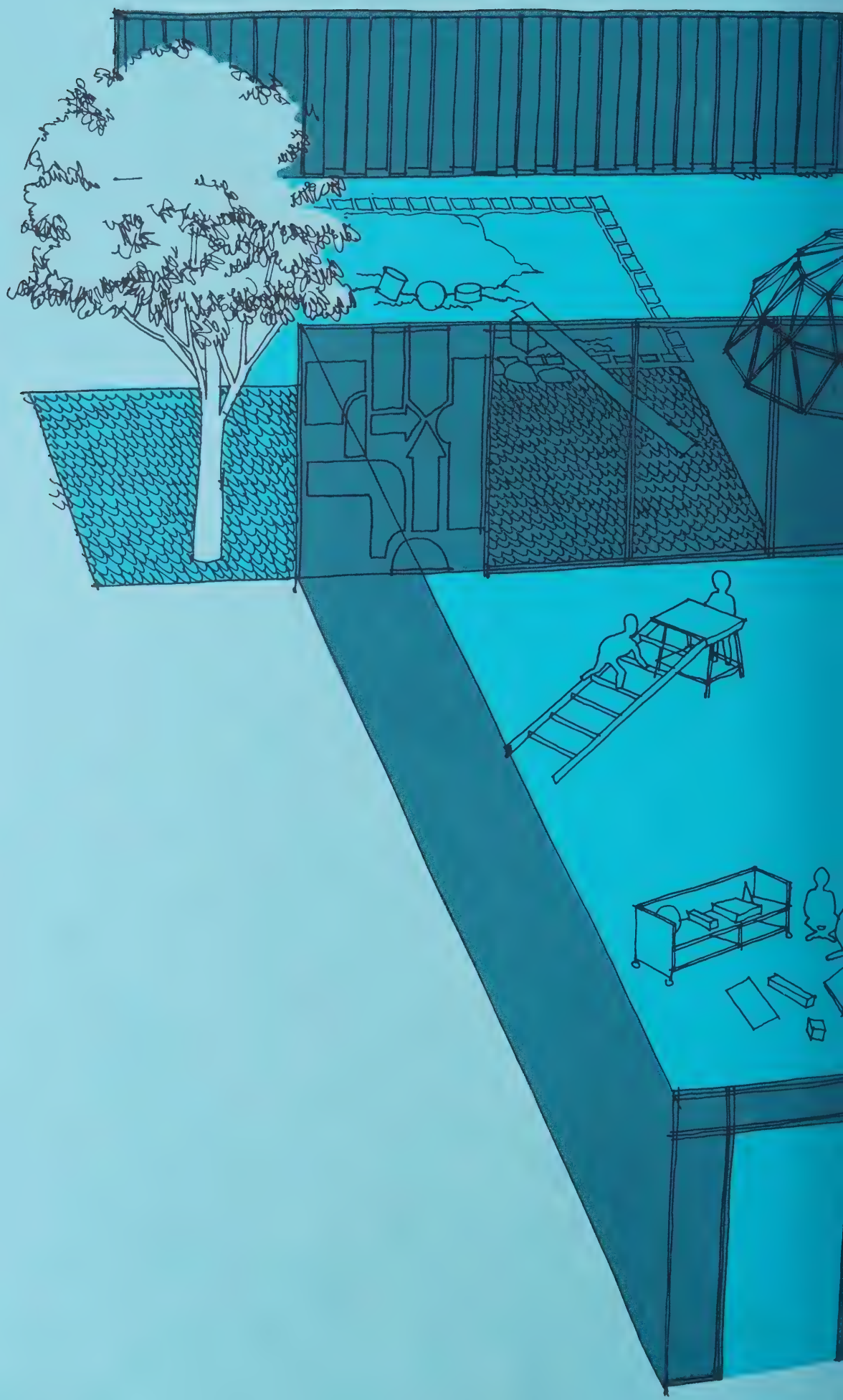
elevated area
Kindergarten
sand pit
Outdoor Area
wet area
Covered Area
store
washroom

continued

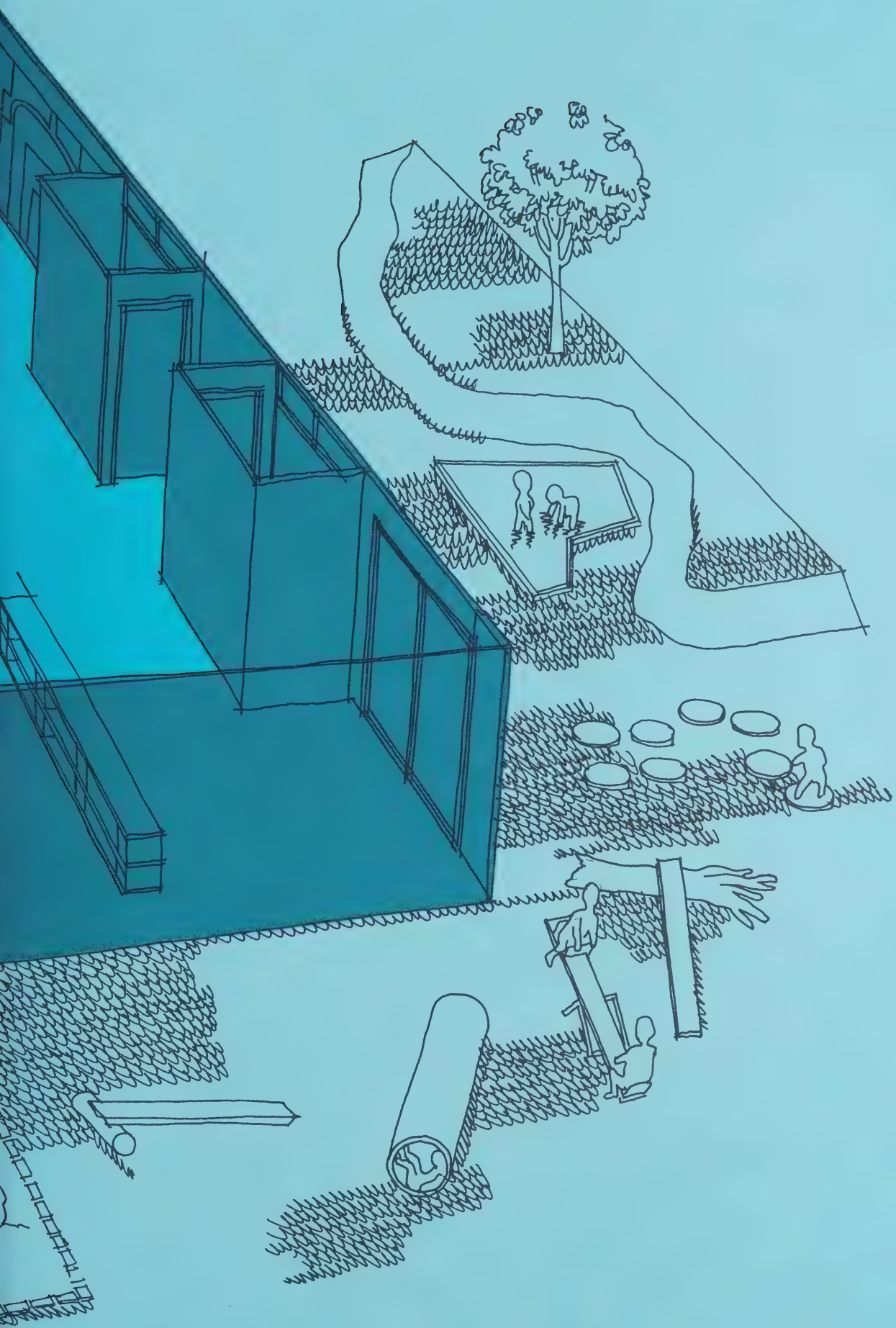
wet area
washrooms
Outdoor Area
Covered
Area
Kindergarten
coats
sand pit
outside
storage

sunken area
washroom
Outdoor Area
wet area
sand pit
Double Kindergarten
Covered Area
washroom
elevated area
sunken area

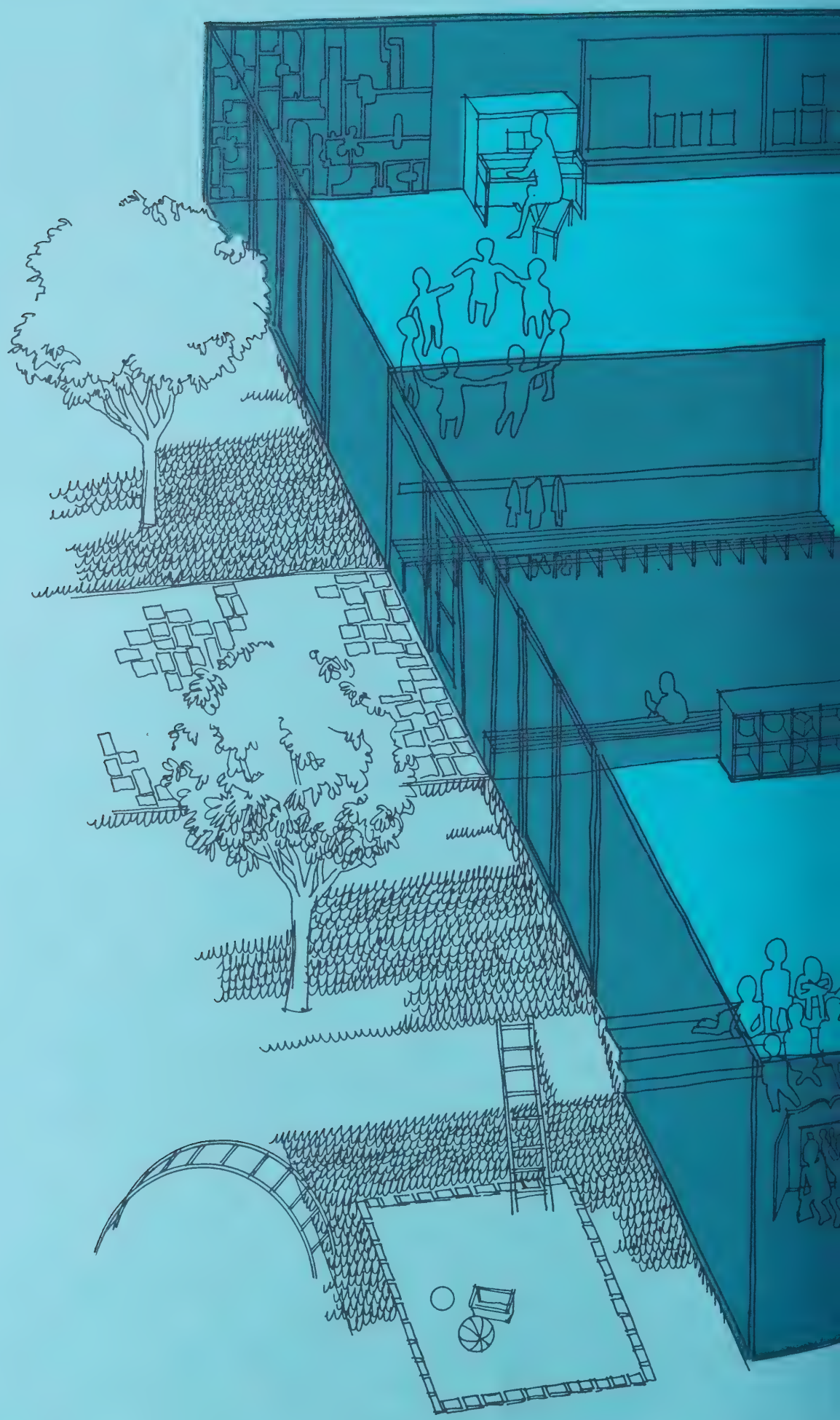
Sketch 1

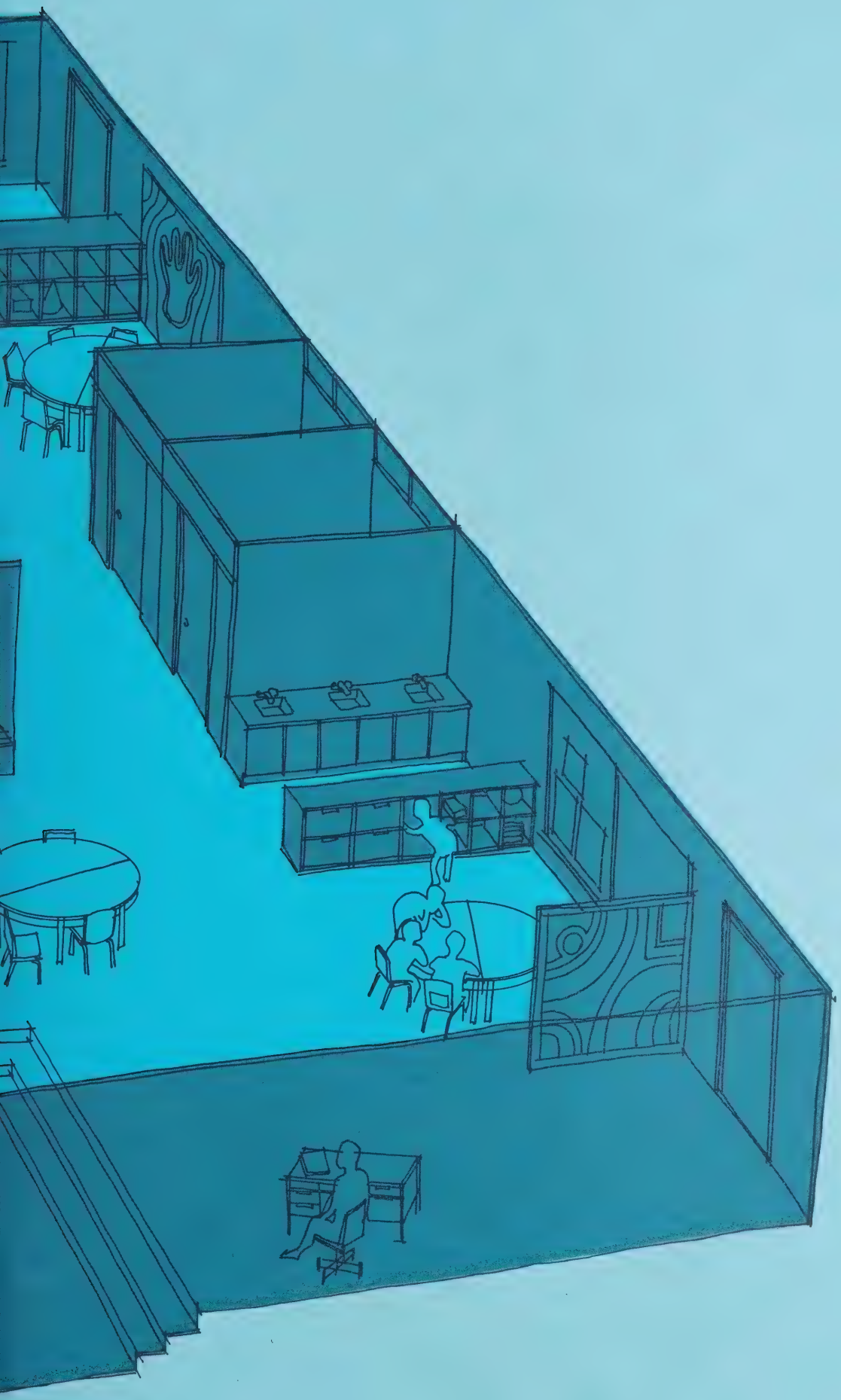


Sketch 2

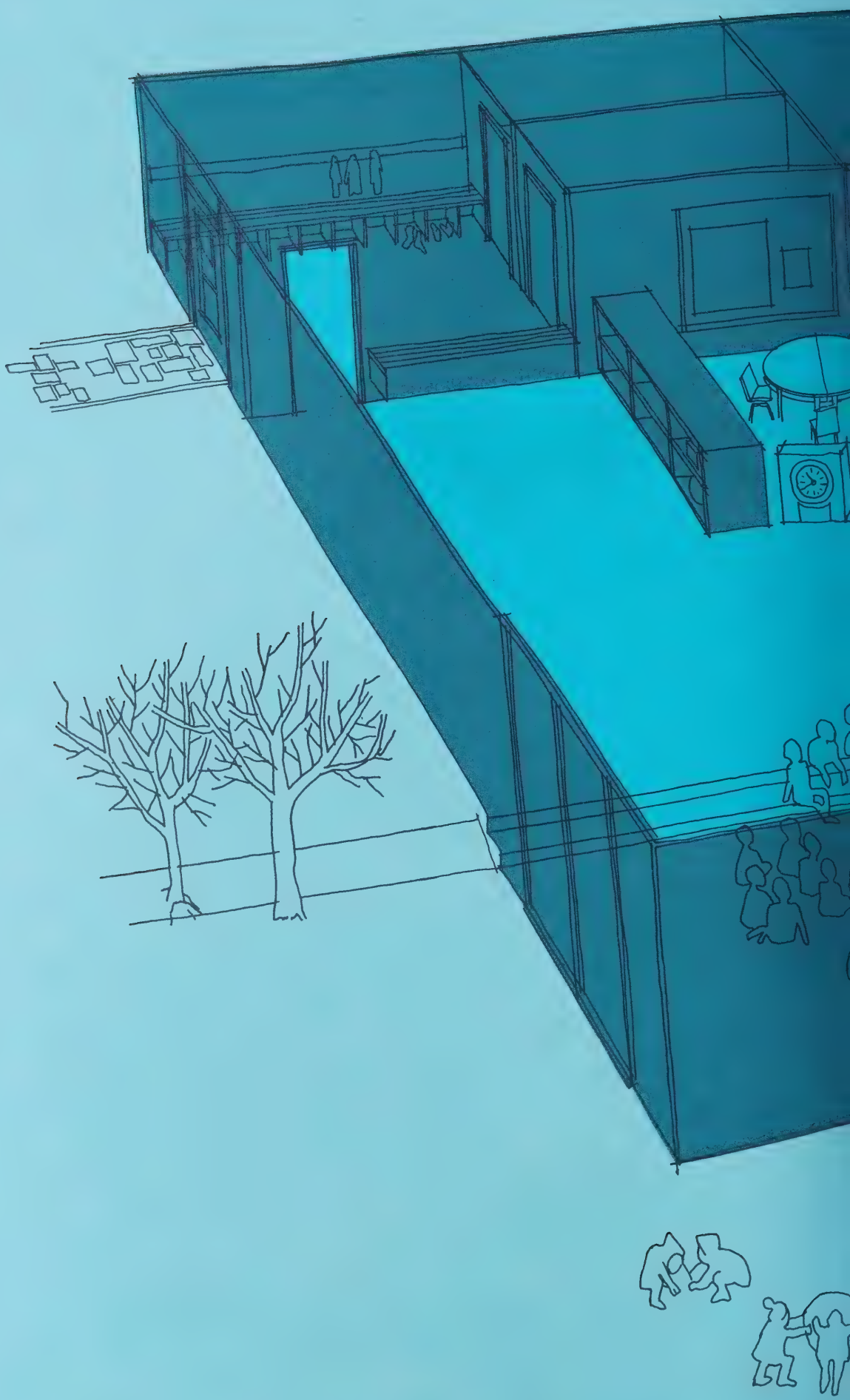


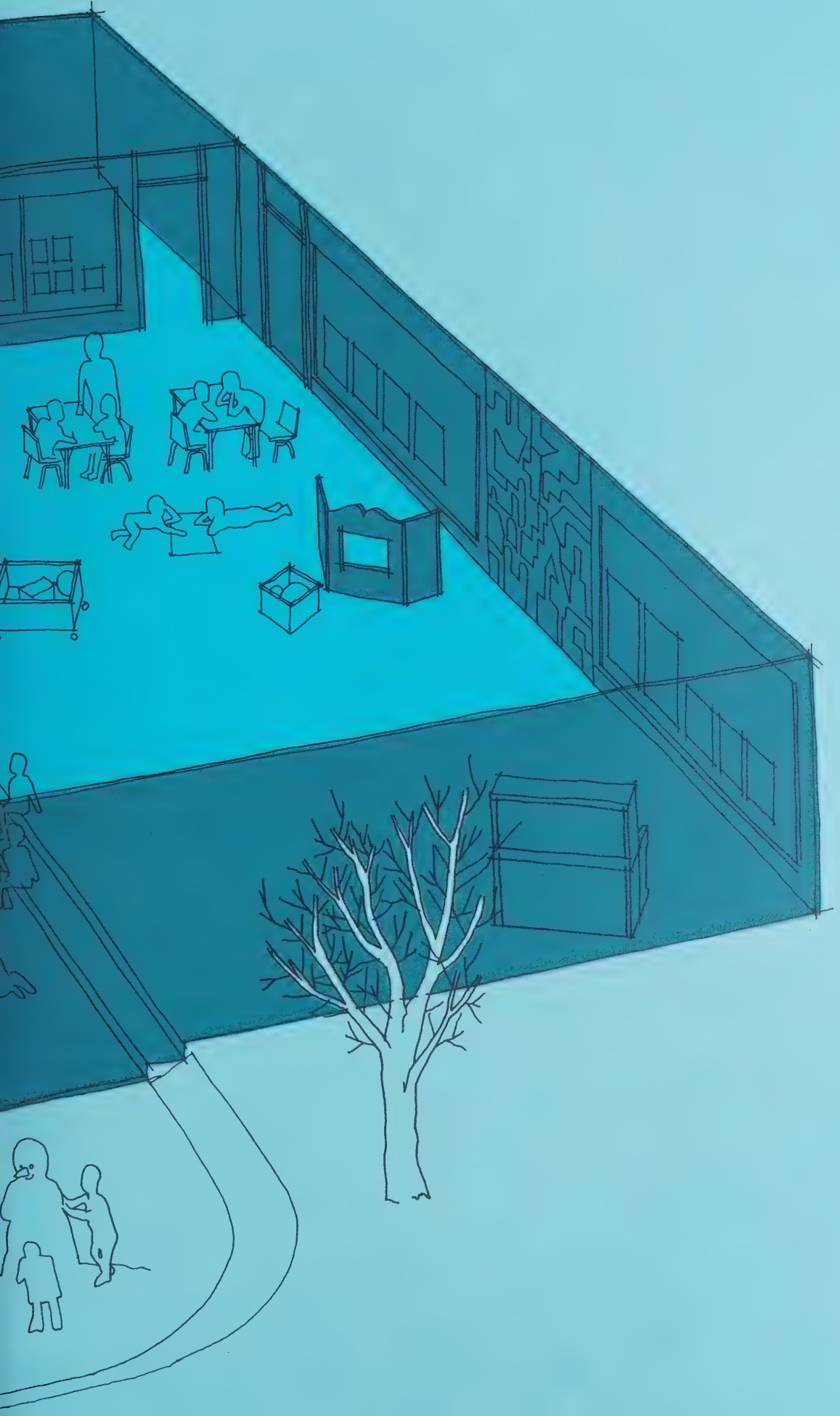
Sketch 3



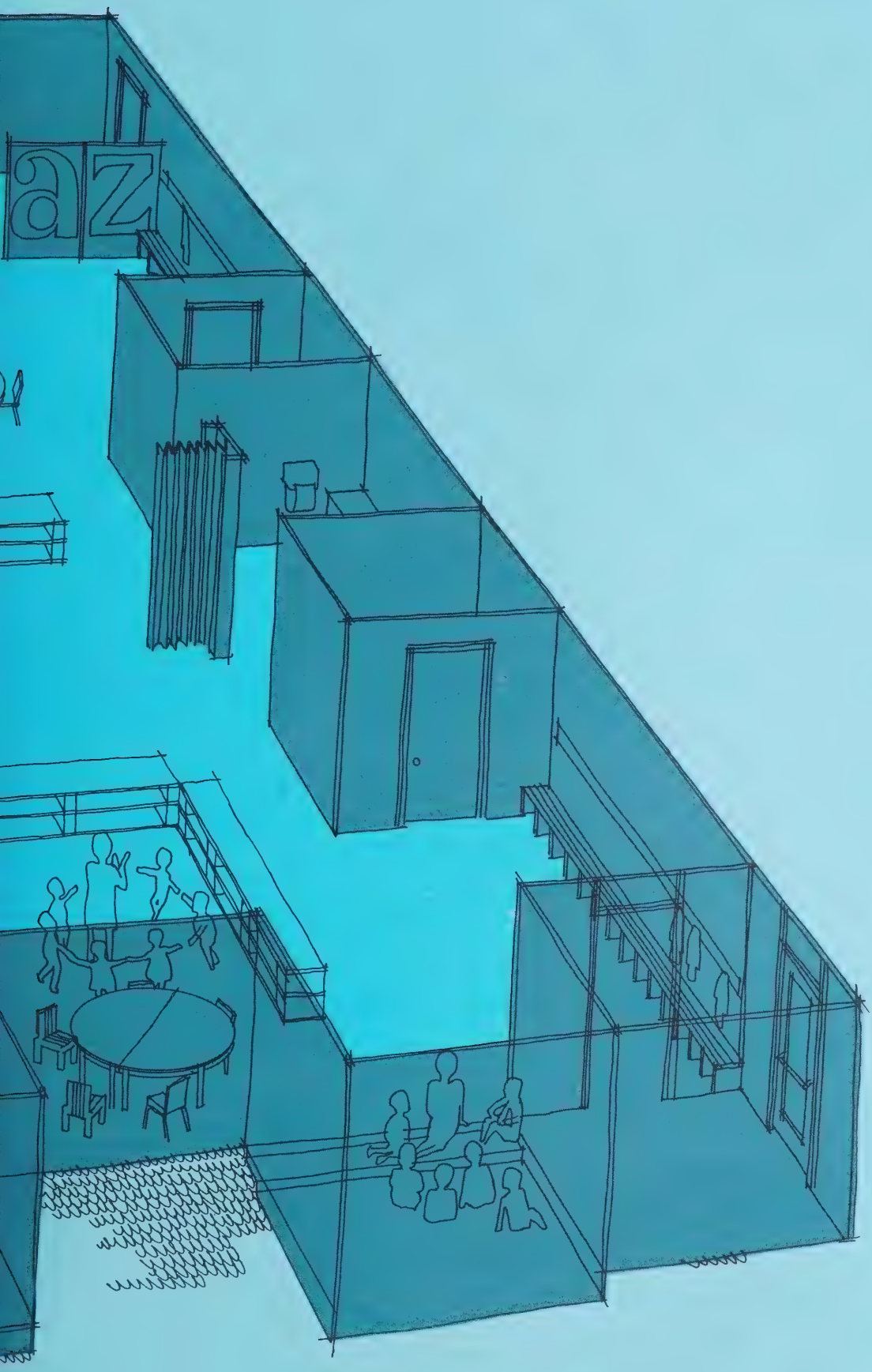


Sketch 4





Sketch 5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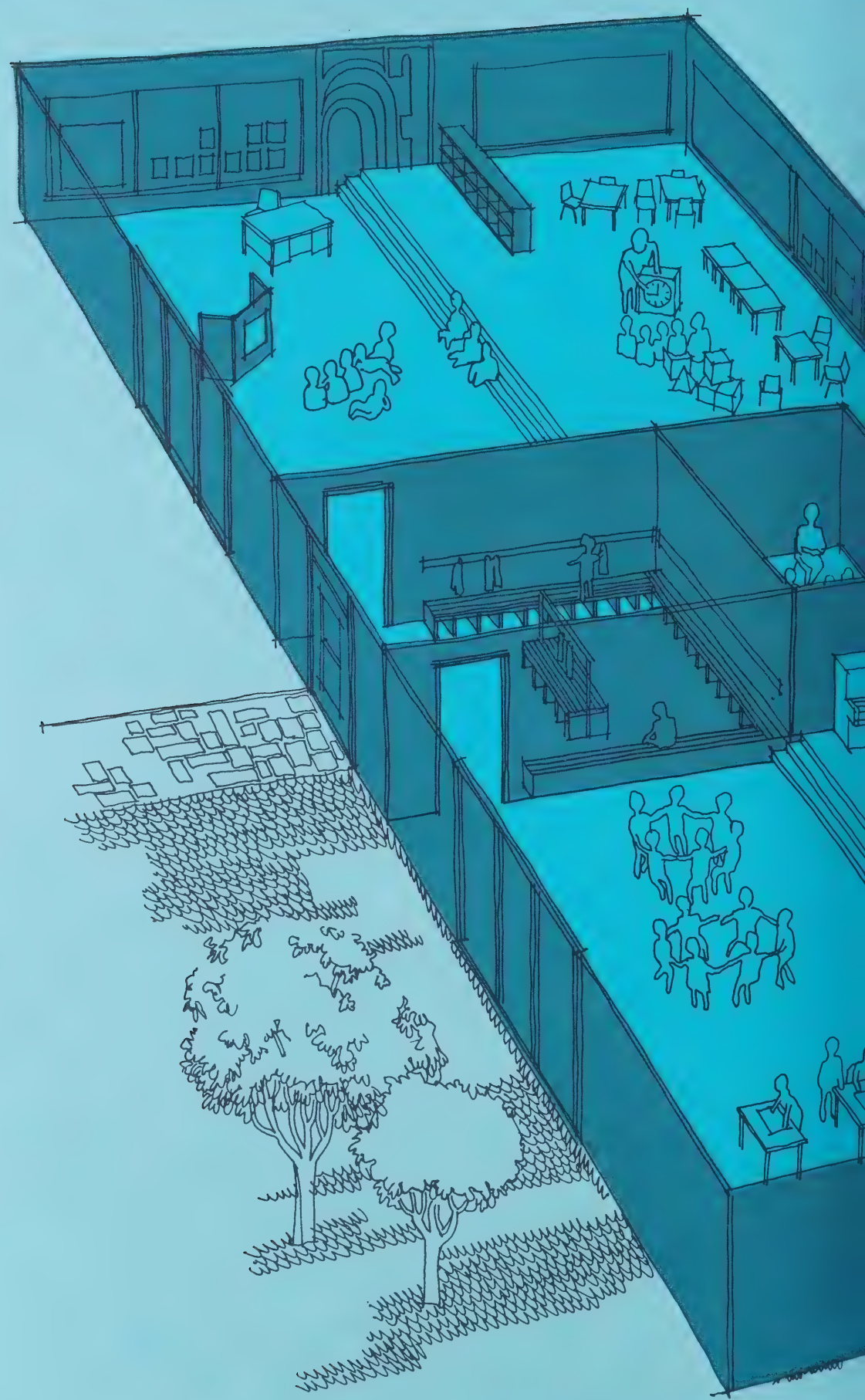
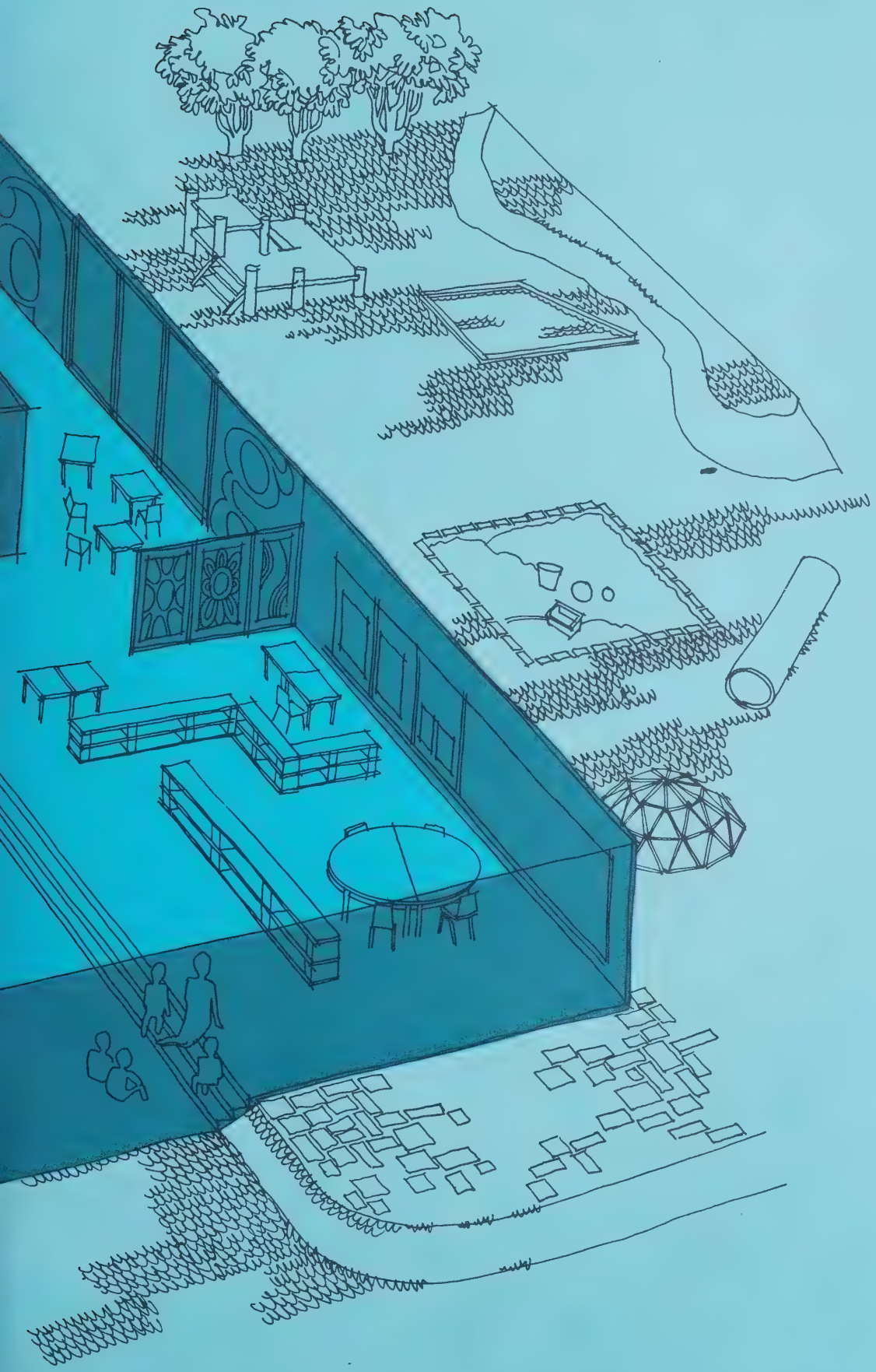
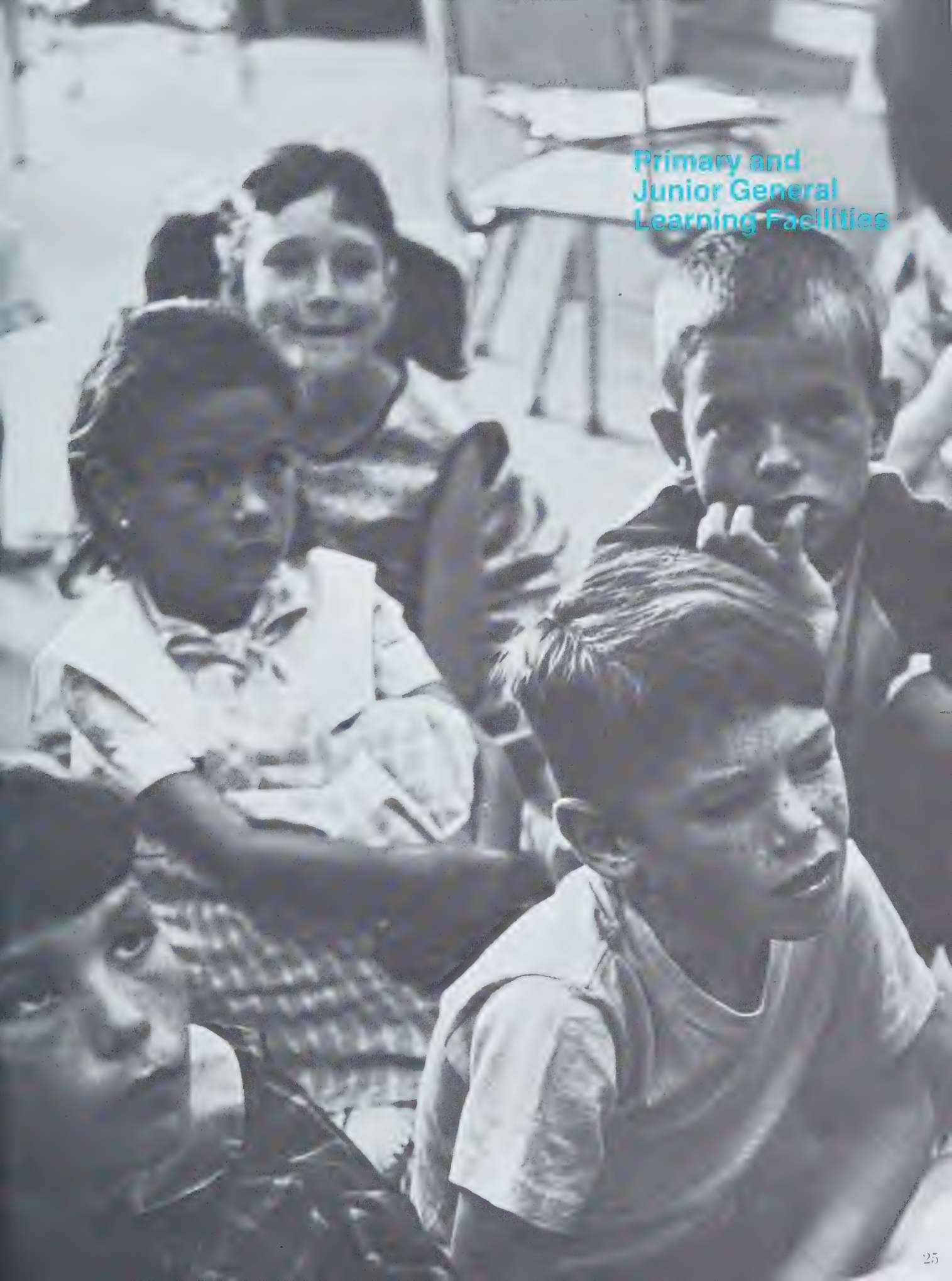
Sketch 6



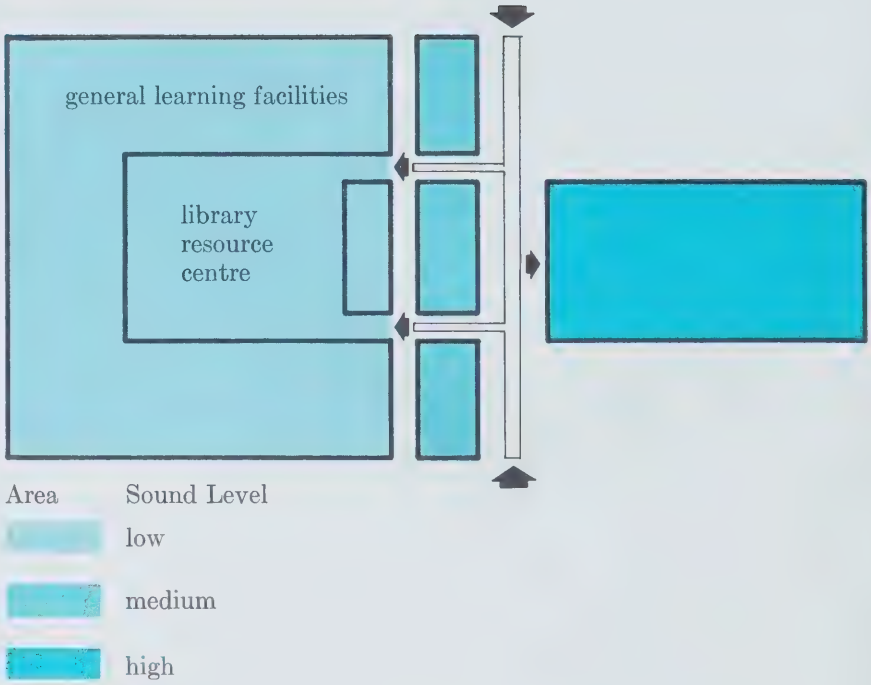




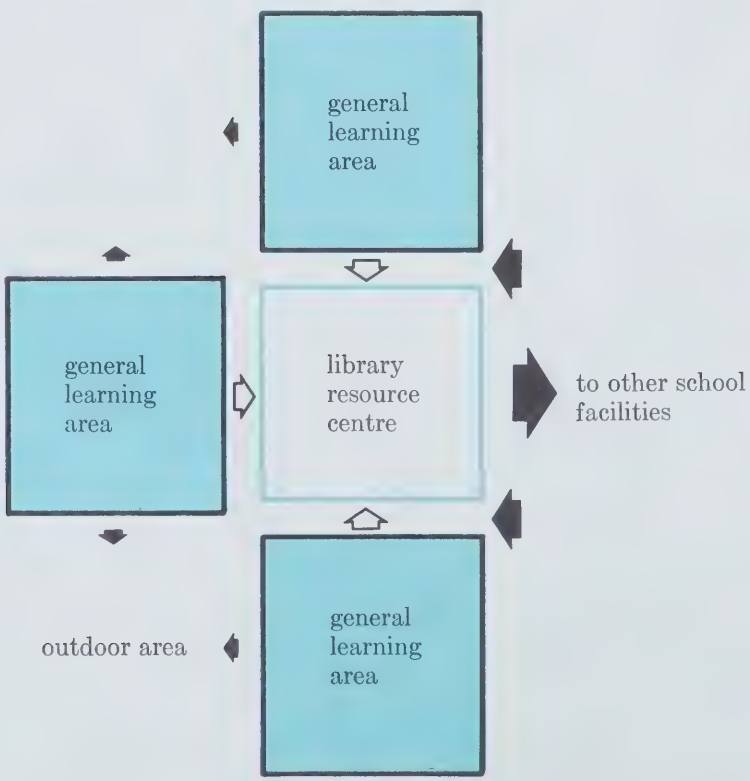
Primary and Junior General Learning Facilities

Location

Sound level and accessibility are the two principal factors that should be considered in determining the location of a general learning facility. It is best located in a quiet section of the school, and should be insulated from areas with high sound levels such as gymnasium, music room, playground, and outside traffic.



The library resource centre and outdoor learning facilities should be easily accessible from the general learning facility.

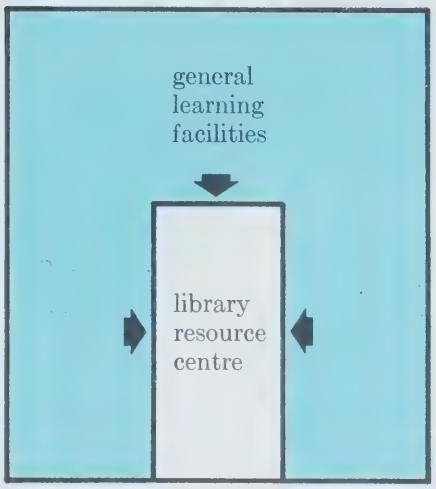


Future Expansion

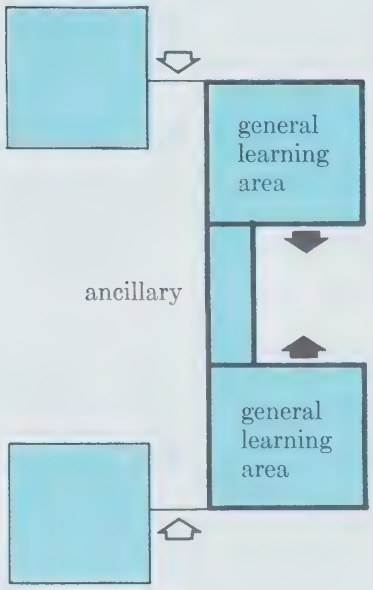
Each general learning facility should be adjacent to another so that removal of space dividers between learning areas and between these areas and the library resource centre can create a completely open learning facility, should this be desired.

It is also important that each general learning area lend itself to convenient subdivision into smaller units.

Internal Expansion



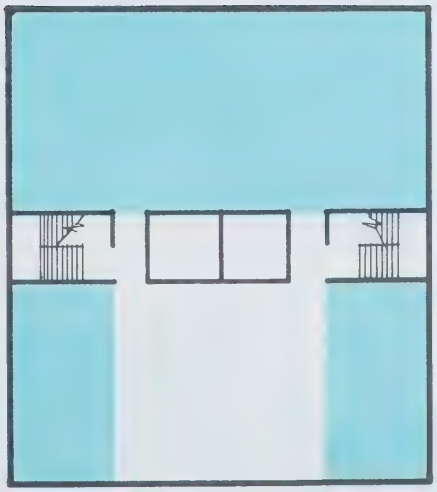
External Expansion



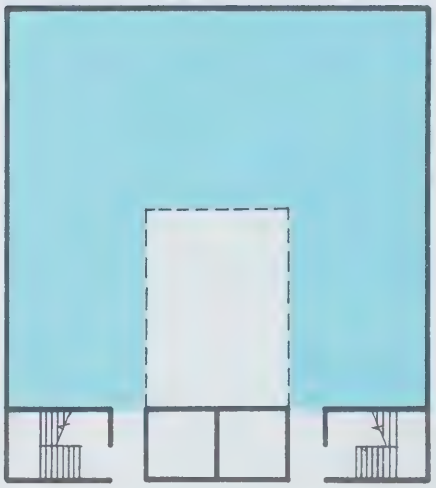
Care should be taken that neither design and shape nor the location of stairwells or washrooms should interfere with interior expansion, as is the case in plan A.

In plan B, staircase and washroom facilities are located in such a way that they do not interfere with interior expansion of the learning area.

Plan A

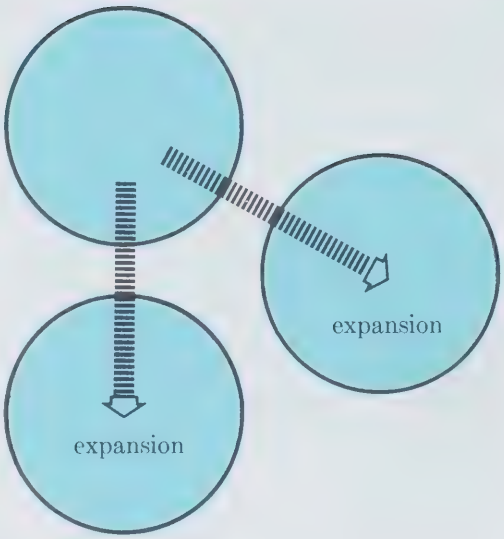


Plan B



Shape

The shape of the general learning facility affects its function. The facility should be adaptable to take into account present and future educational philosophy and teaching methods. Of the following basic shapes considered, the circle appears to be the least advantageous.



Circle

structurally complex, and costly to erect

expansion is difficult and results in an excessive circulation area

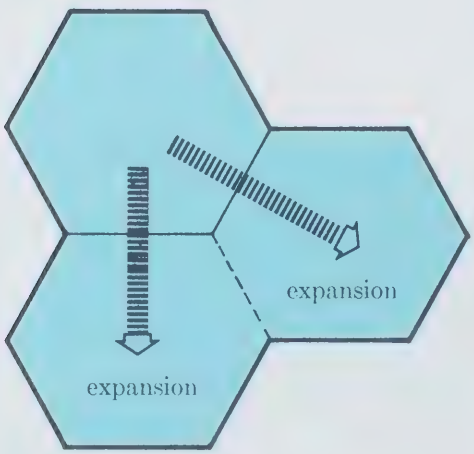
has the smallest perimeter for a given floor area but is costly to build

suitable furniture arrangements are difficult to achieve

fixed items such as chalkboards and shelving require non-standard units and are therefore expensive

installation of floor and ceiling finishes result in wasted material

acoustical and lighting techniques are complicated

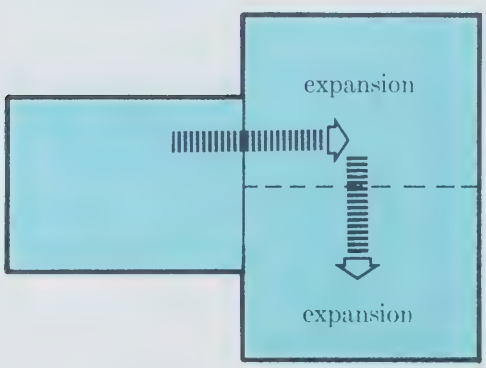


Hexagon

expansion is possible but only with the addition of another complete module

careful planning is required to avoid waste space at the angled corners

good acoustics can be achieved



easy to construct

expansion is infinite

interior arrangements are flexible

standard units of chalkboards, tackboards and shelving can be employed

no special acoustical or lighting problems

provides more opportunities to create a variety of learning situations

Size

To facilitate the learning process and achieve a functional general learning area in an open concept, additional facilities are required. These are: a seminar area, a teachers' planning area, and a wet area. The recommended space requirements for a general learning area and ancillary facilities designed to serve a group of thirty-five pupils are as follows:

general learning area	750 sq. ft.
seminar area	50 sq. ft.
teachers' planning area	50 sq. ft.
wet area	50 sq. ft.

An open-space concept reduces the circulation area required for these facilities. Thus the total unit area may be increased to 900 sq. ft. while the gross area of the school remains approximately the same as that found in more conventional solutions.

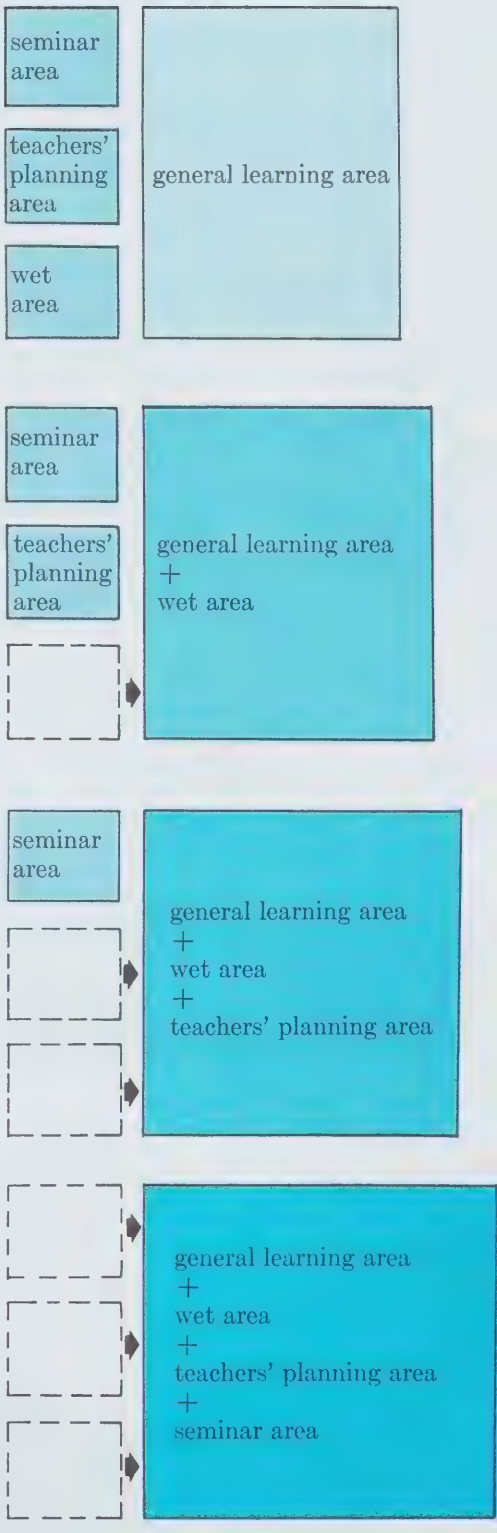
Our research indicated that the optimum size for a general learning area is that which can accommodate 140 pupils — the equivalent of four traditional learning areas (classrooms), plus seminar, teachers' planning area, and wet area.

The number of possible solutions for creating the physical make-up of a general learning area is virtually infinite; any solution, however, will be dependent upon local conditions. These include: number of users; teaching program and methods and the types of activities planned; size of school site and its geological and topographical nature; budget limitations; availability of certain materials.

Space Relationship

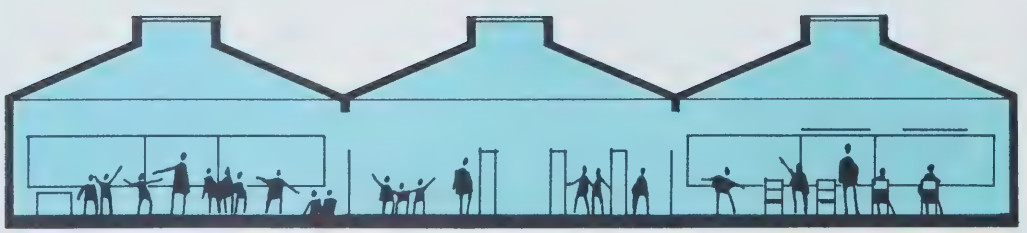
The ancillary facilities can be adjacent to the general learning area or they can be shared by two general learning areas.

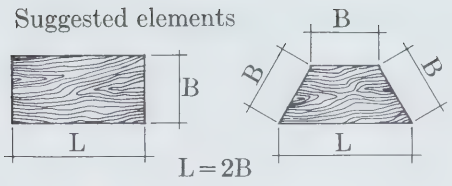
Any or all of the ancillary facilities can be included within the general learning area.



Height

The large open spaces make it necessary that some provision be made to control sound interference between spaces. Variations in ceiling heights can help to contain sounds that originate within the spaces as well as to define teaching areas. The cost, however, is greater. The minimum clear heights should be 9 ft.





Requirements

Furniture

To suit the program and learning methods, furniture should:

permit efficient use of the learning area;

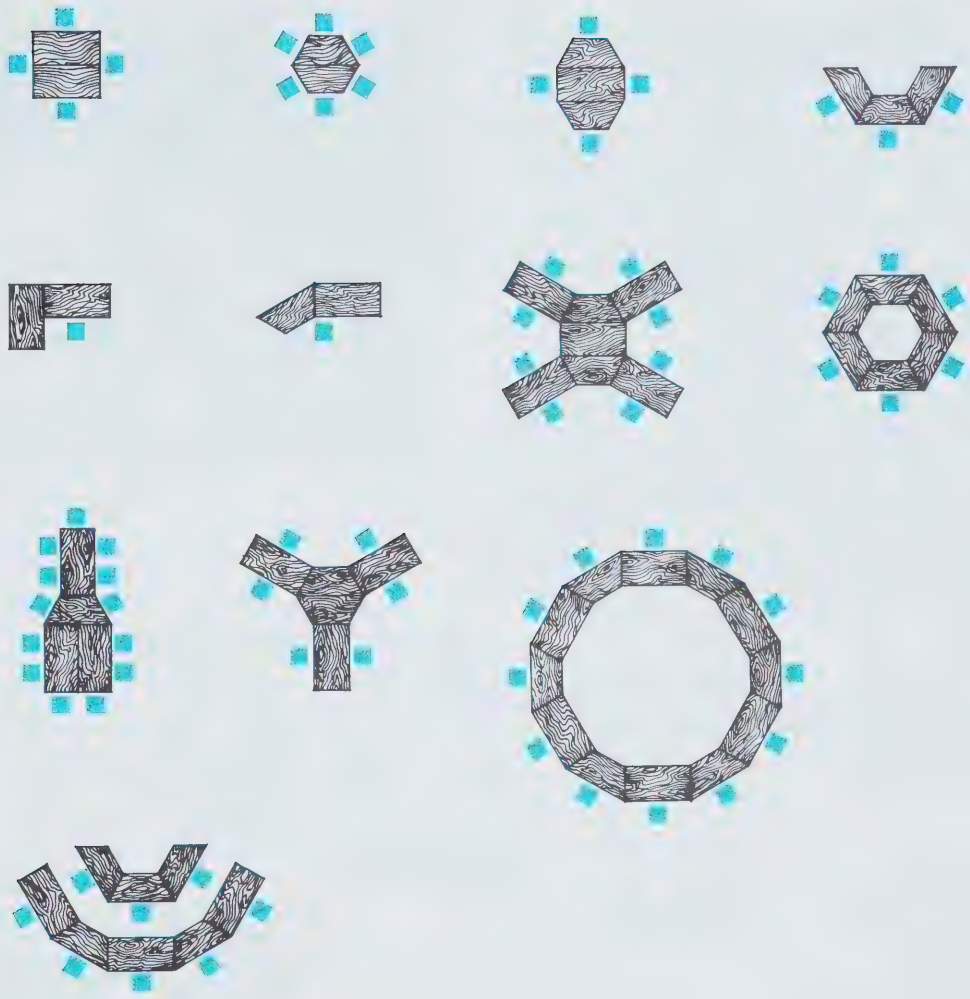
be flexible and allow a variety of arrangements to suit different activities;

be dependable, adjustable, and durable;

be easily moved;

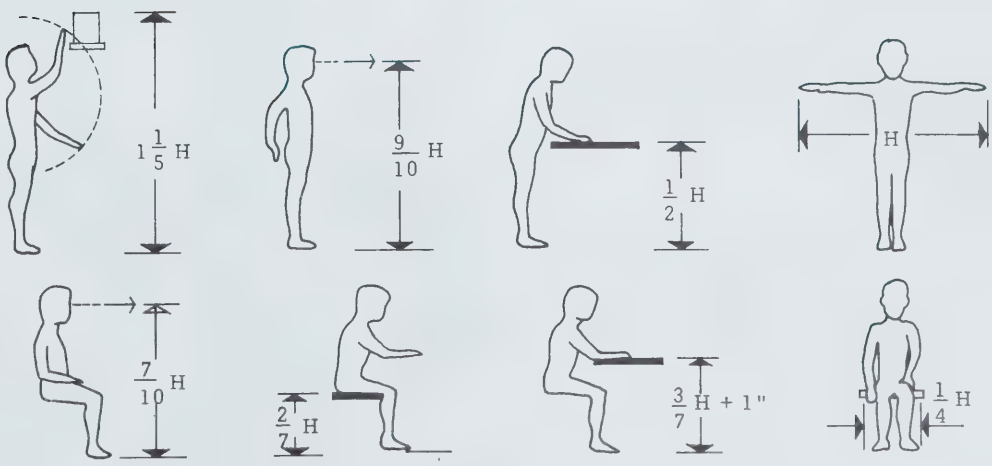
be designed for comfort and correct posture in relation to the user's anatomy.

The arrangements illustrated suggests possibilities that allow greater freedom in learning.



If shelves are too high to reach, and seats are too small to sit in with comfort, the school cannot function properly. These are some characteristics of the pupil to be considered in designing the school's furniture.

Age	Average height in inches H
5	44
6	47
7	49
8	51
9	53
10	55
11	57



Chalkboards and Tackboards

Chalkboards are an essential element in the general learning area, but they should not dominate the space. The chalkboard area should be large enough for all the teacher's requirements. The use of sliding boards (vertically or horizontally) or leaf-folding boards will preserve valuable wall space for other purposes. Free standing chalkboards can also be provided.

Heights should vary so that teachers and pupils can be accommodated without arm fatigue. A dull finish is essential to provide an easy writing surface and avoid reflection which causes eye fatigue. Any combination of colours that provides sufficient contrast and that fits into the overall colour scheme of the general learning area may be used.

Maximum use should be made of tackboards to display notices, pupils' drawings, pictures, and so forth. The tackboards may extend to the ceiling line.

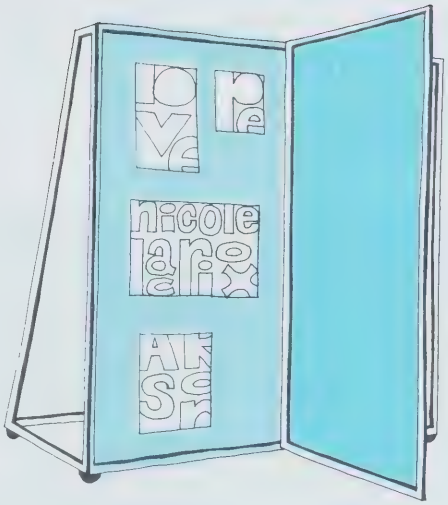
Work Counter

A work counter equipped with a sink unit and storage cupboards underneath for small equipment and sliding trays will provide useful storage space. The counter surface should be water and stain-resistant. The counter height should be related to the average height of pupils in the age group.

It is recommended under normal circumstances that this unit be located within the wet area.

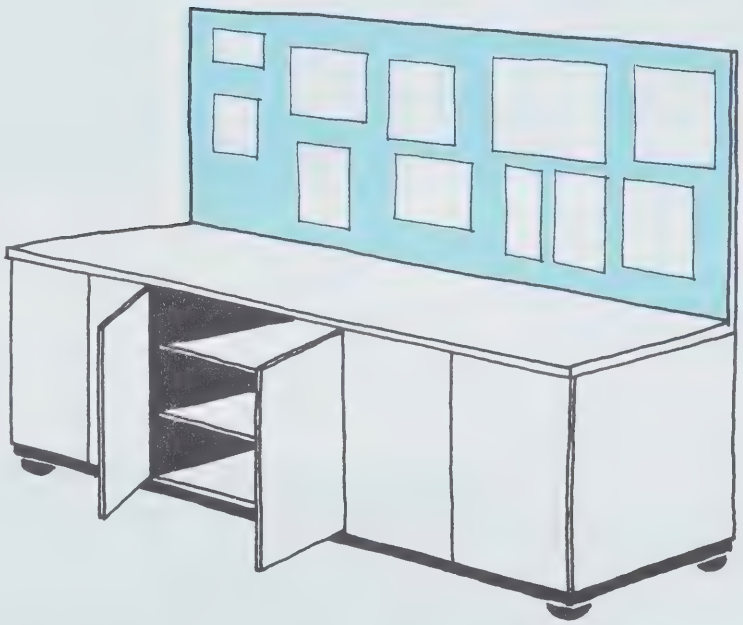
Display Units

Combinations of chalkboards, display units, and shelves may be used for chalking as well as for a flexible three-dimensional display of the pupils' work.



Storage

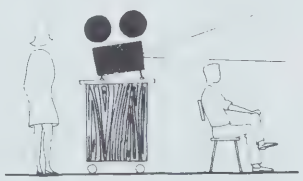
Whether or not a separate storeroom with fixed shelving is provided, ample cupboard space is an essential requirement in the learning area. Usually this may be ordered directly from manufacturers' catalogues, but it is important to bear in mind that it should be scaled to the size of the children and should provide the right kind of storage space for the type of equipment used. As the latter varies, it is essential that the cupboards themselves be adaptable; some of them need not have shelves at all, and in those that are so equipped the shelves should be adjustable within a considerable range.



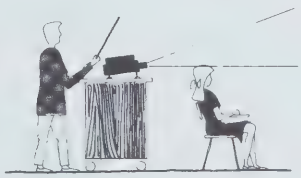
Audio-visual Equipment

The general learning facilities should be designed in such a way that the users can use the audio-visual equipment without having to spend a great deal of time getting the facility prepared and the equipment set up.

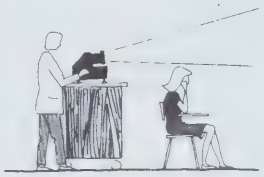
There are many different types of audio-visual equipment. It is recommended that the type as well as the number of units to be ordered by the school be decided after careful consideration of the teaching program, teaching methods and enrolment.



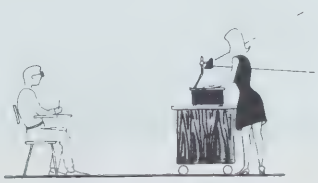
Movie projector



Slide projector



Opaque projector



Overhead projector

Micro-film projector

Rear-screen projection

Teachers' Planning Area

This facility provides an area where team-teaching and co-operative planning techniques can be formulated and individual work programs prepared.

Location

This facility can form a part of, or be adjacent to, the general learning area.

Size

An area of 200 sq. ft. is suitable for four teachers, based on a recommended allowance of 50 sq. ft. per teacher. An enclosed facility is desirable.

Furniture and Equipment

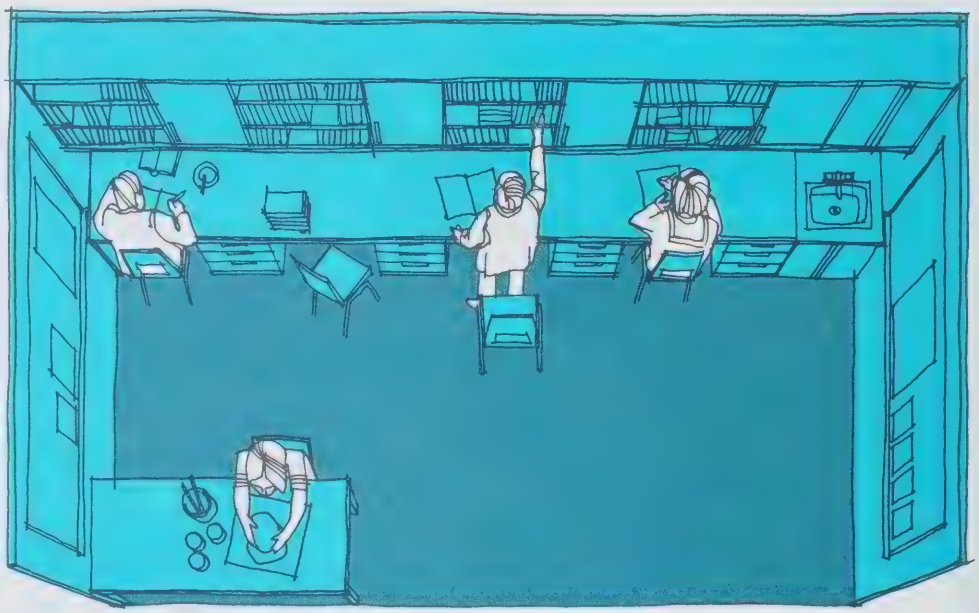
Fifteen to twenty linear feet of both tackboard and chalkboard space is recommended. Each teacher will require a desk, a chair, and a two-drawer filing cabinet scaled to teachers' needs. Built-in casework with appropriate knee-hole space and drawers for small supplies is desirable. A combination of adjustable open shelving and cabinets for storage, securely mounted on the wall above the teacher's work area, should be supplied.

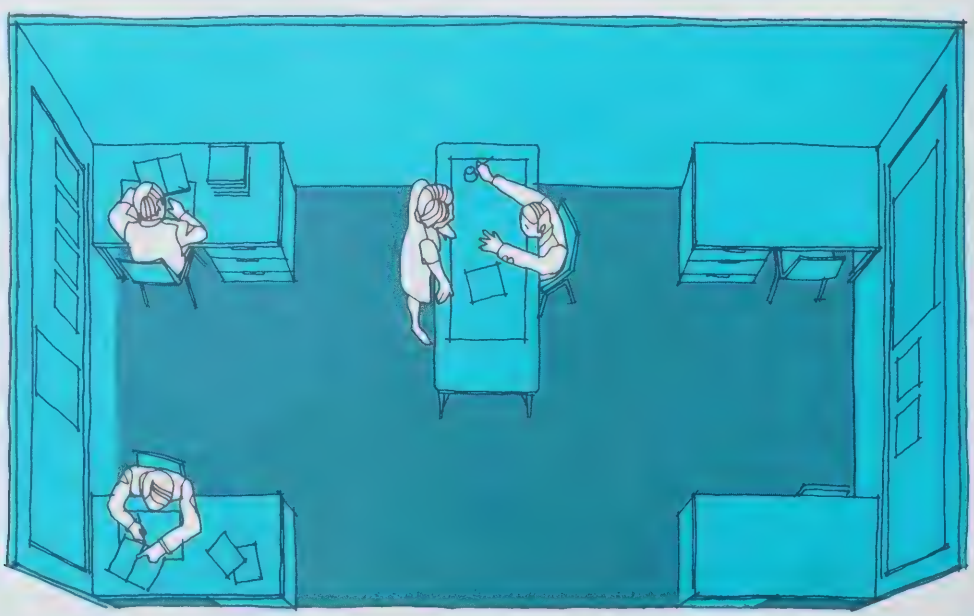
A work counter equipped with a sink unit and a table for planning meetings is also desirable.

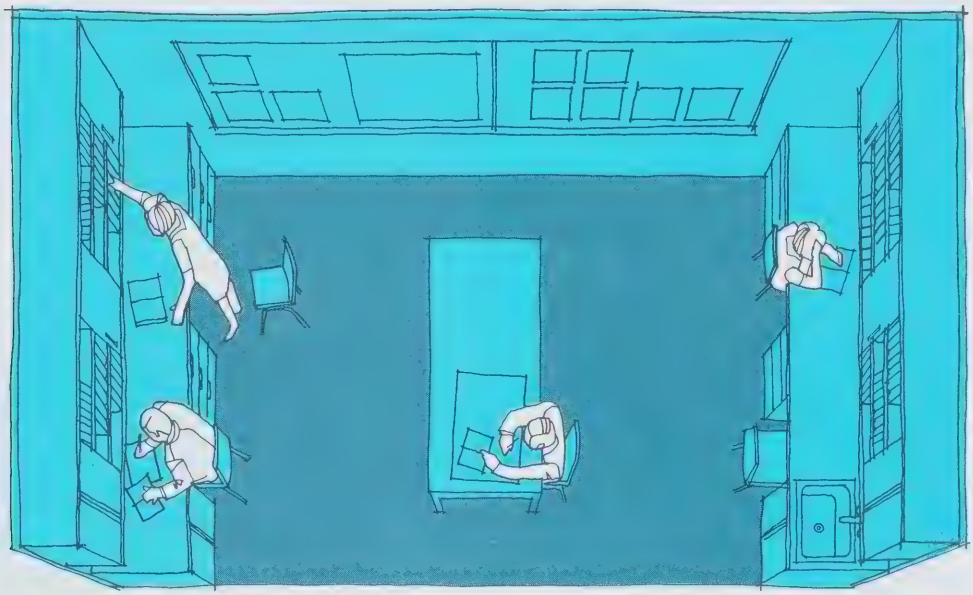
Conveniently located electrical outlets for audio-visual presentations and a typewriter are essential requirements.

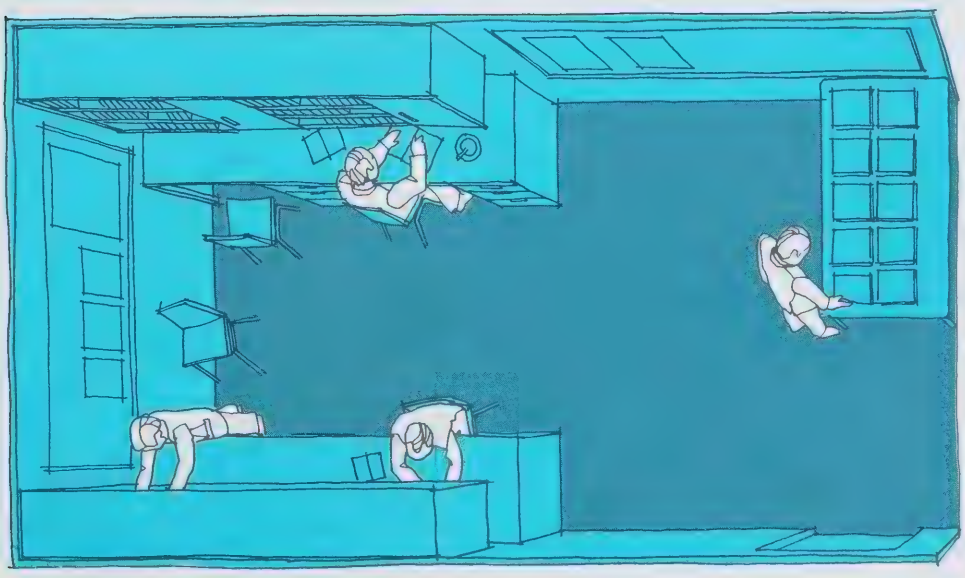
Various Arrangements

Area 200 sq. ft.









Wet Area

An open-concept learning facility should contain a "wet area" in order to accommodate activities that require the use of a water supply. In addition, such an area should be equipped with materials used in drawing, painting, clay modelling, paper cutting, dry and liquid tempera painting, wood cutting, and work with plastics.

Location

The wet area can be located so as to serve one or several general learning areas or it may be located in a central common area. The educational program and its objectives will determine the most advantageous and desirable location.

Size

An area of 200 sq. ft. is suitable for the needs of four learning groups, based on a recommended allowance of 50 sq. ft. for each group of 35 pupils.

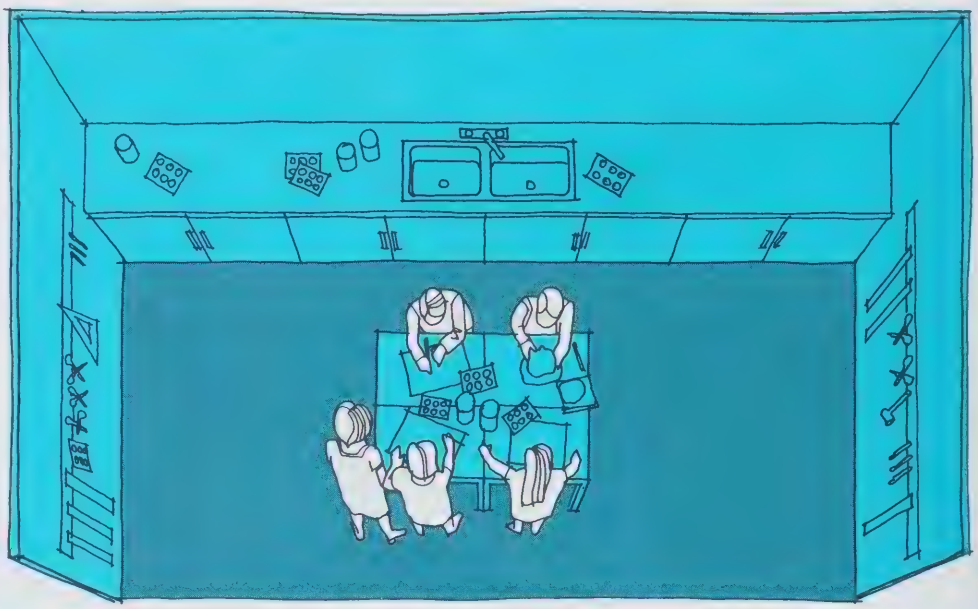
Storage and Equipment

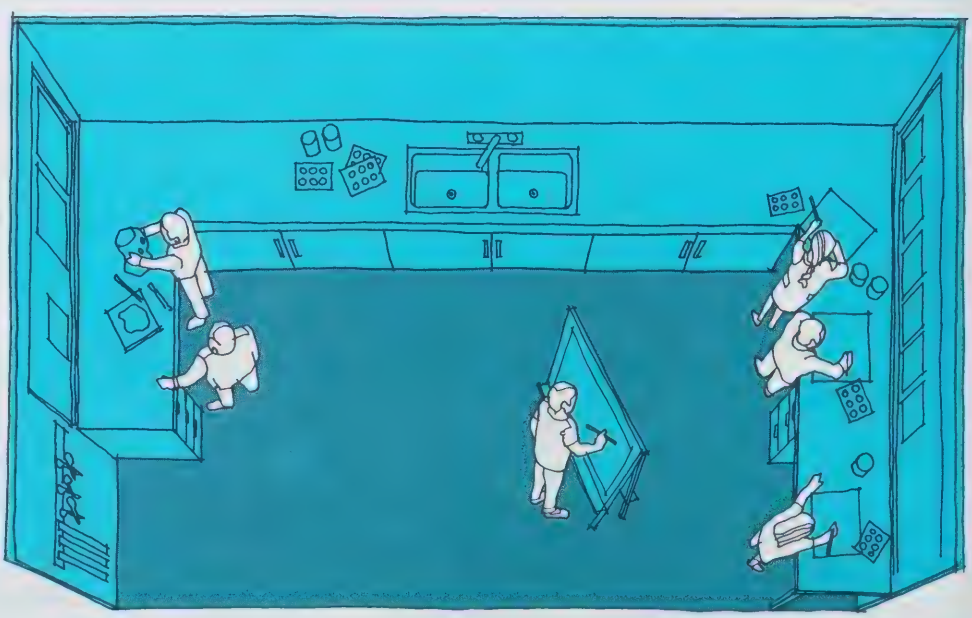
Provision should be made for sufficient open shelving and cupboard space for storage of supplies and equipment. Equipment should include a double sink with a water supply and a water- and stain-resistant counter top. Counter space and work tables are essential. Flooring should be water-resistant.

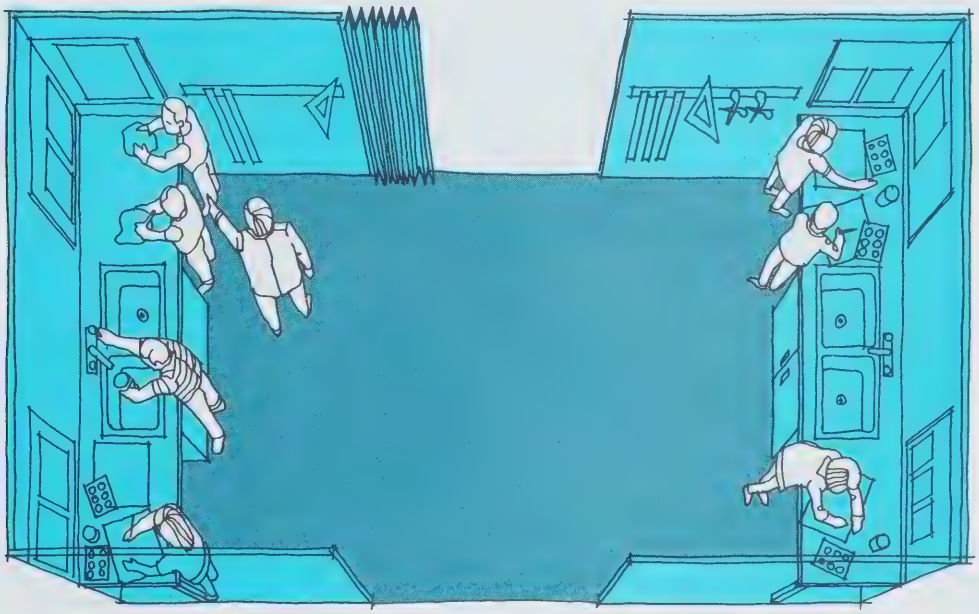
Tackboards for display of student work, and instructional materials should be provided.

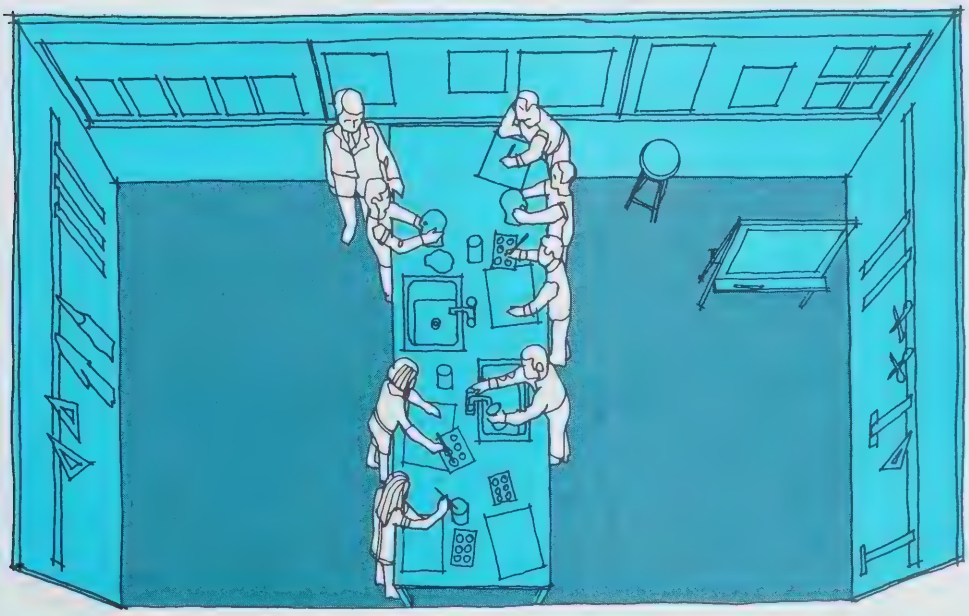
Various Arrangements

Area 200 sq. ft.









Seminar Area

A seminar area is desirable in an open-concept learning facility to accommodate special activities involving either a relatively high sound level or a need for privacy.

Location

Maximum benefit will be realized if location is determined through consultation with the educational authorities. The seminar area can be located to serve one or several general learning areas. Proximity to the general learning area is desirable in any case.

Size

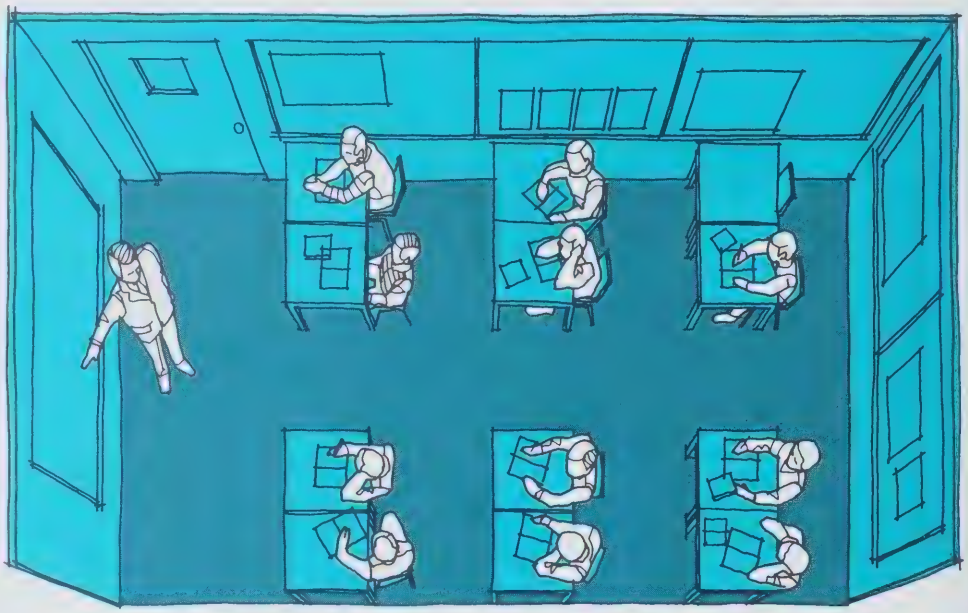
If an enclosed seminar area is included, a maximum of 50 sq. ft. for each group of 35 pupils, with a minimum of 150 sq. ft. for any seminar area, is recommended. Arrangements may be designed to suit the requirements of educational programs.

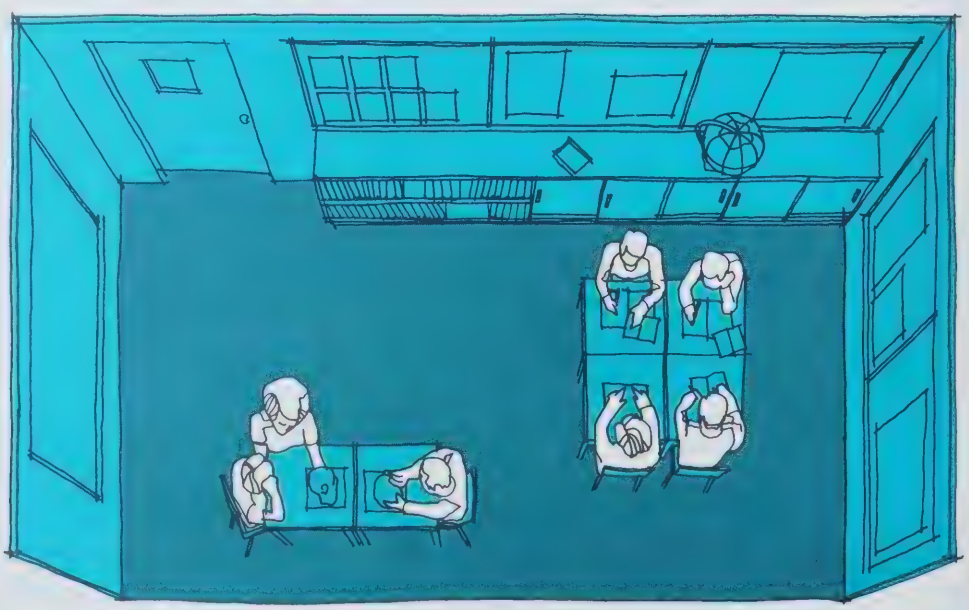
Furniture and Equipment

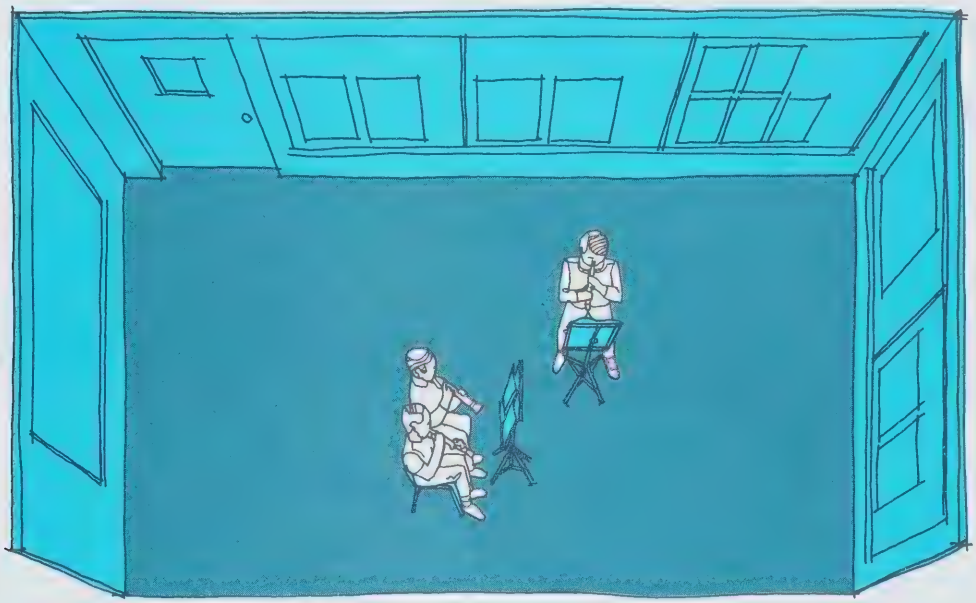
All furniture and casework should be scaled to the average size of the pupils. Electrical outlets will be required for audio-visual presentations. A small adjustable projection screen, tackboard, and chalkboard will also be required.

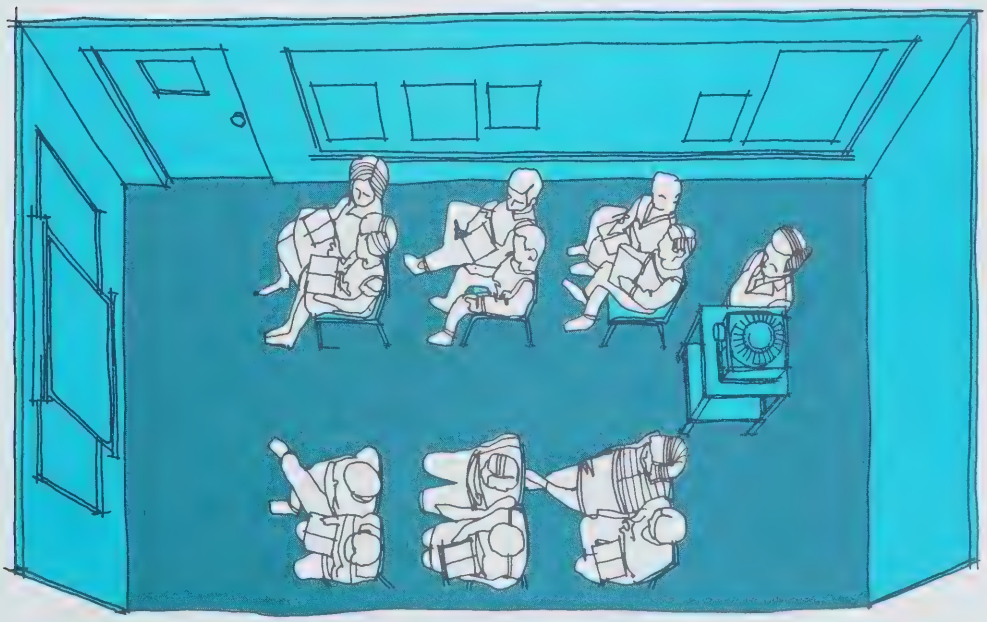
Various Arrangements

Area 200 sq. ft.









Acoustics

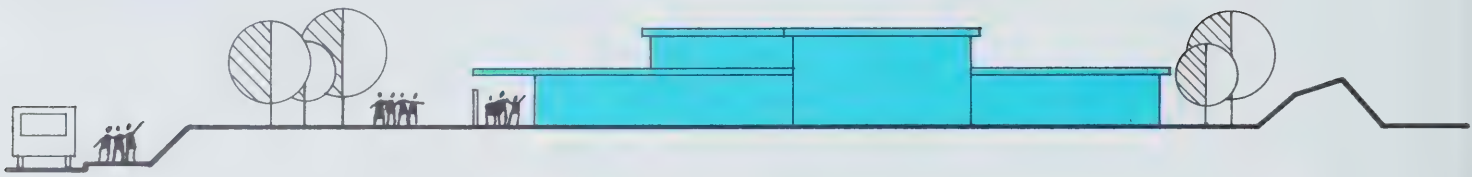
Extraneous Sound

Proximity of learning areas to extraneous sources of sound should be an important factor in the selection of a school site. Where it is not possible to avoid locating the school near railways, highways, and so forth, protection from such extraneous sources of sound can be achieved by:

changing of levels

screening with earth mounds

screening with trees.



Interior Sound

The use of sound insulation materials and proper construction methods can reduce airborne sound (voices, vibration of partitions, etc.) to a minimum.

The use of carpeting can reduce impact and equipment noises (footsteps, plumbing and mechanical installation, etc.) to a minimum.

The use of both acoustically treated ceilings and carpeted floors is not recommended. Where this occurs within large open spaces, sound tends to be absorbed too efficiently. The space acts acoustically like an outdoor area and thus the teacher has to raise his voice to compensate.

Careful timetabling, designed so that noisy and quiet activities are not scheduled concurrently or in adjacent spaces, can reduce the sound within the learning area to an acceptable level.

The use of space dividers will also help to contain sound within the immediate vicinity of individual teaching stations.

Lighting

Good lighting is a particularly important feature of a learning area for it affects a very wide range of activities, many of which have to be carried on in the same space.

The success with which a school building is able to provide a satisfactory environment for learning depends to an important degree upon the efficiency of its lighting.

Lighting that is insufficient or of low quality results in inferior academic work and an increase in accidents.

Natural Light

Although natural light is not the main source of light (being inconsistent during the winter months and on cloudy days and non-existent in the evening), windows are desirable so that students may have some visual contact with nature. Windows also help to prevent claustrophobic feelings. The size of the windows should be a matter of local decision; large glassed areas, however, must be avoided. Black-out facilities should be provided so that the space may be used for film and slide presentations.

Artificial Light

The maintained learning area illumination should be not less than 70 foot candles at desk level. A single row of fluorescent lighting fixtures should be provided over chalkboard surfaces.

The flexibility of the open-space learning area also requires flexibility in the lighting system so that small areas may be lightened or darkened according to the activity taking place.

The creation of an interesting environment with an appropriate visual character necessitates that both the lighting, natural and artificial, and the colour and texture of the interior surfaces of the space be considered simultaneously, as they are often complementary.

Heating and Ventilation

Heating a learning area, or almost any area, is a relatively simple task. Combining heating with ventilation, however, is an entirely different matter.

School learning areas require an adequate heating system and an efficient ventilation system. The following are essential in maintaining a comfortable thermal environment in school learning areas:

individual room control

rapid morning warm-up

good air distribution

quick response to thermal changes

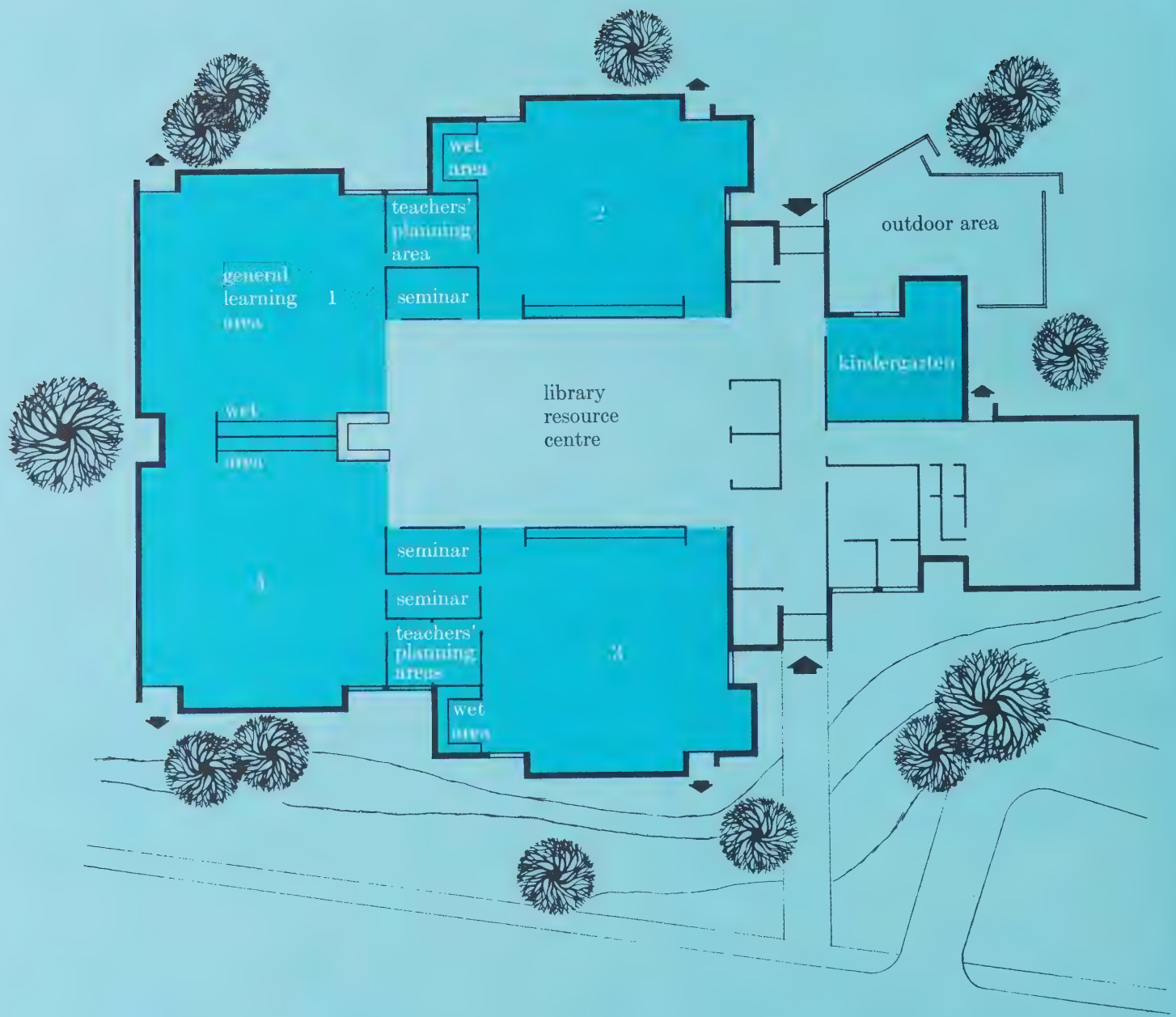
air filtration

quiet operation

adequate ventilation for air freshness and odour control

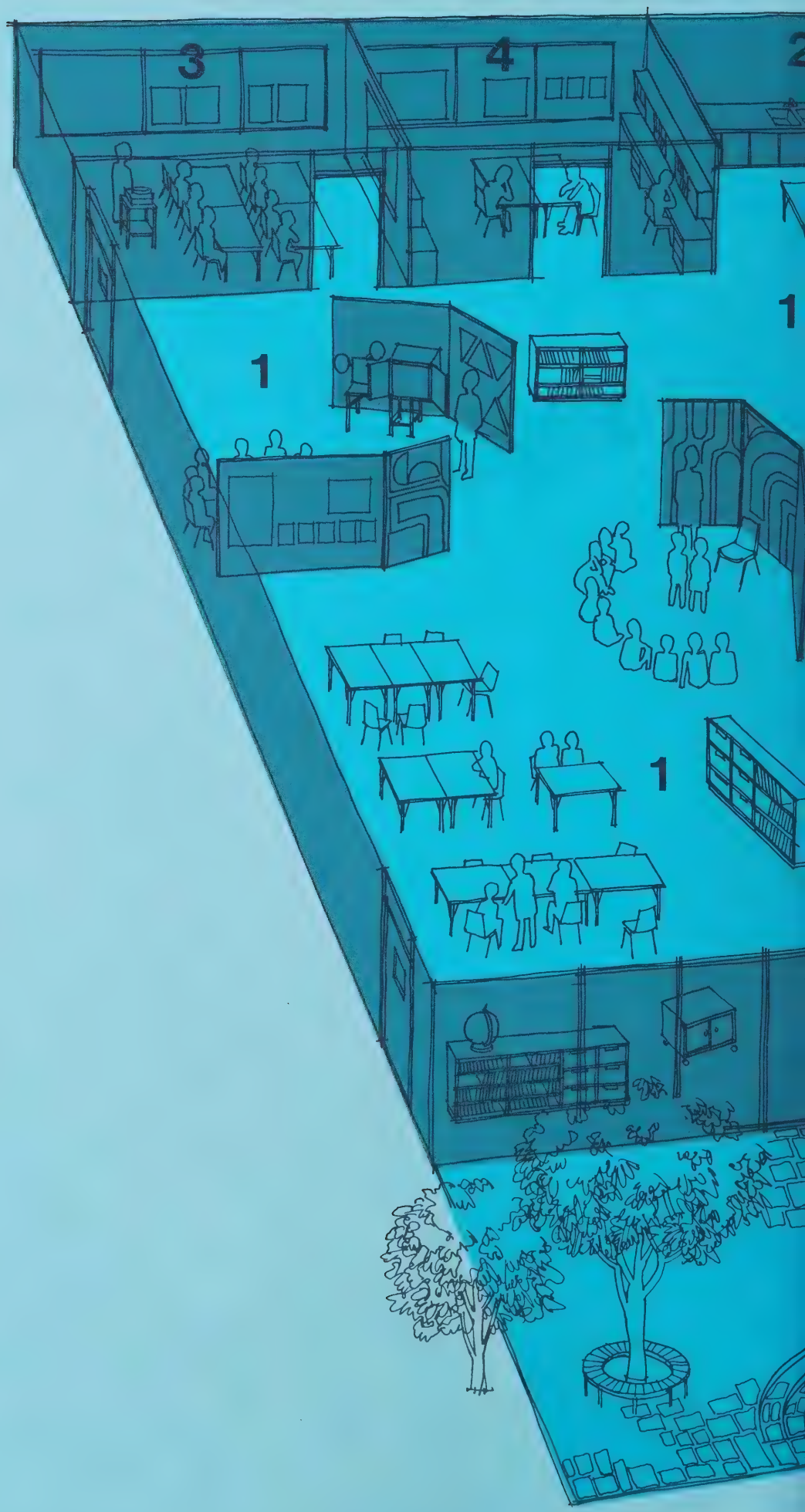
Criteria for Heating and Ventilation

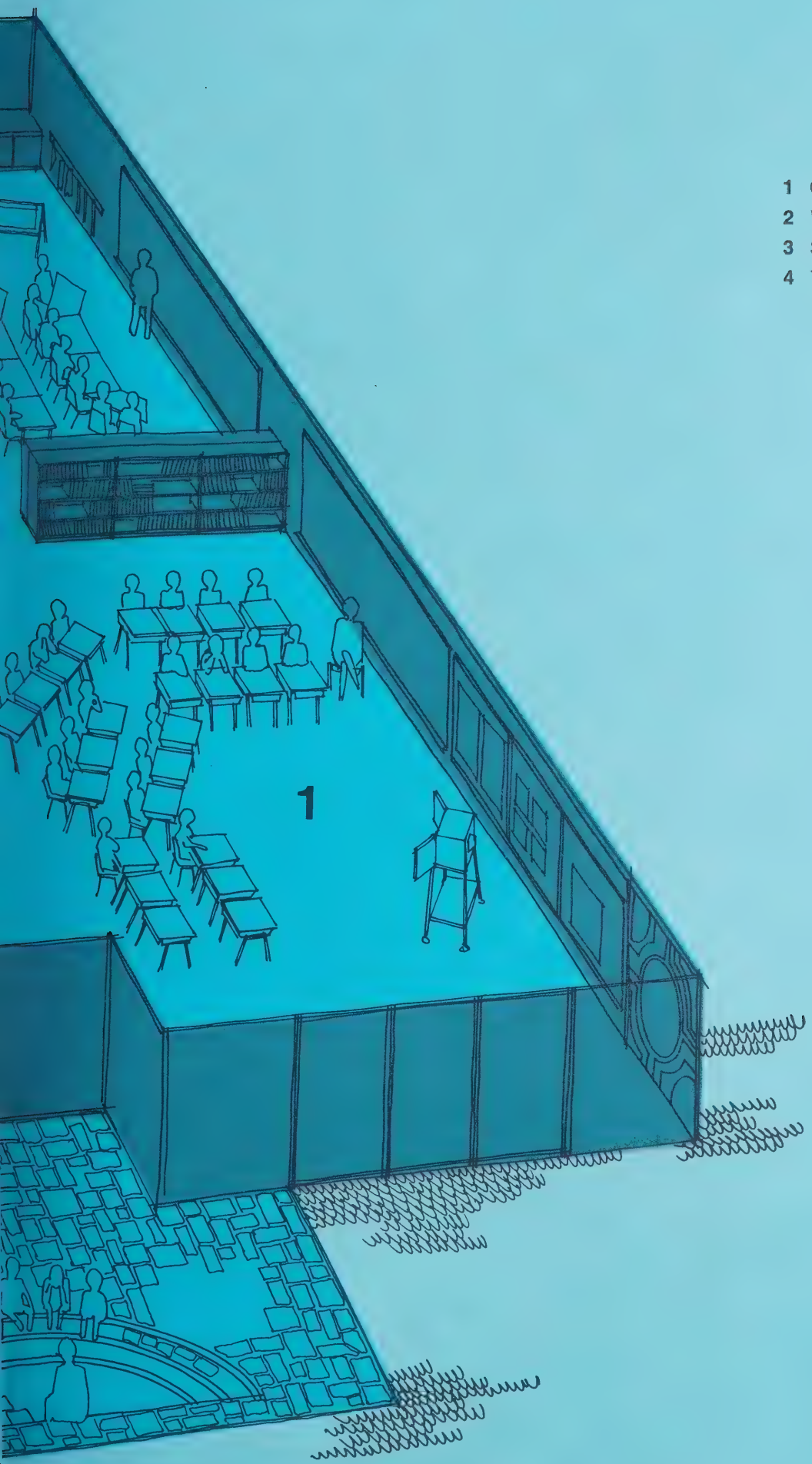
Atmospheric Criteria			Desirable	Tolerance
Temperature	Outside Temperature	90 F°	78°	± 2°
		0 F°	72°	± 2°
Relative Humidity	Outside Temperature	90 F°	50%	± 5%
		0 F°	30%	± 5%
Outside Air		CFM per sq. ft.	0.3 to 0.8	0.2
		CFM per person	15 to 30	8
Air Changes		per hour	6 to 8	5
Air Movement		velocity: FPM	25 to 40	± 10


wet area
teachers' planning area
2
outdoor area
general learning area
1
seminar
kindergarten
library resource centre
wet area
seminar
seminar
teachers' planning area
3
wet area

double kindergarten
outdoor area
general learning area
seminar
t. p. a.
wet area
washroom
seminar
wet area
teacher planning area
library resource centre
seminar
t.p.a.

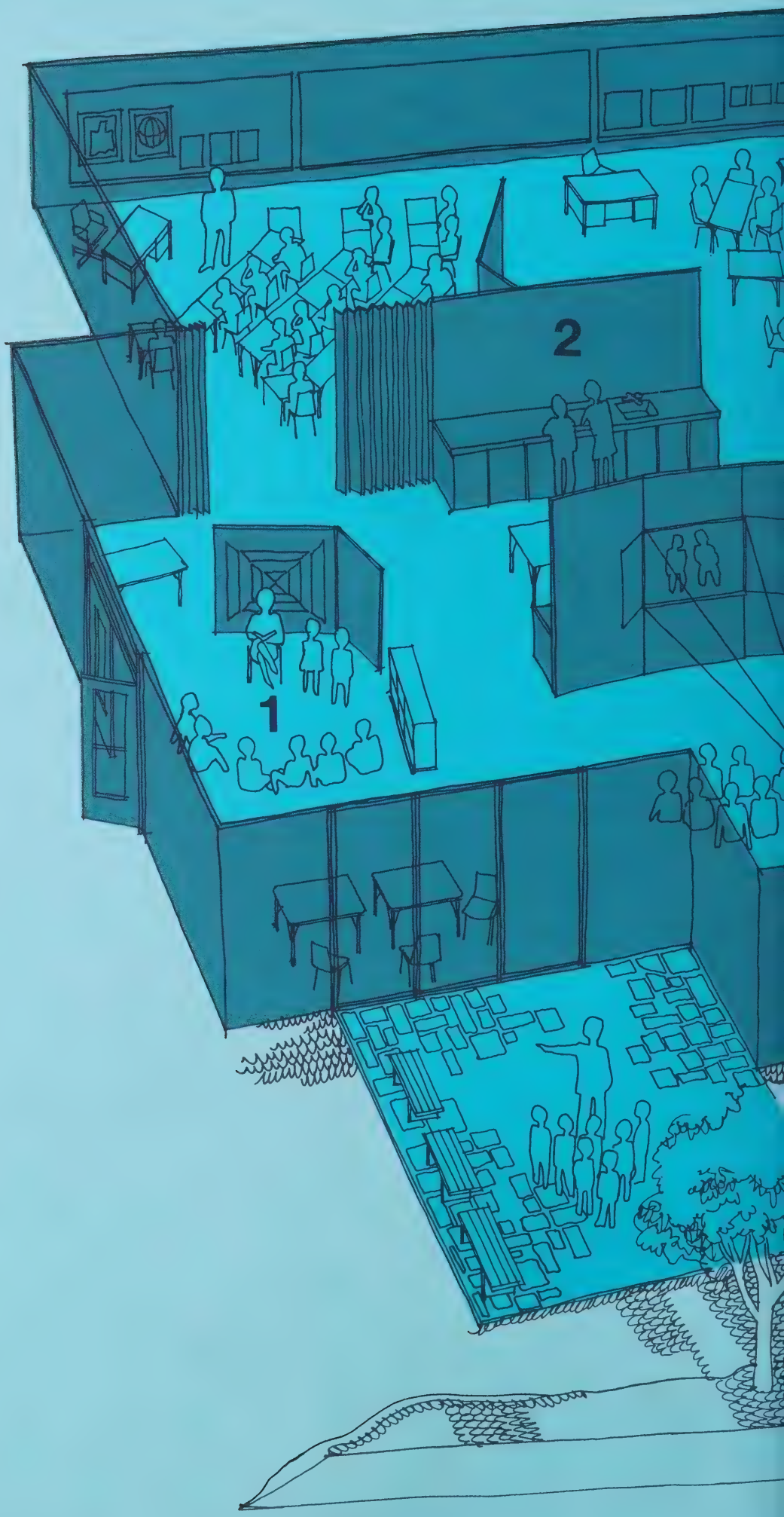
Sketch 1

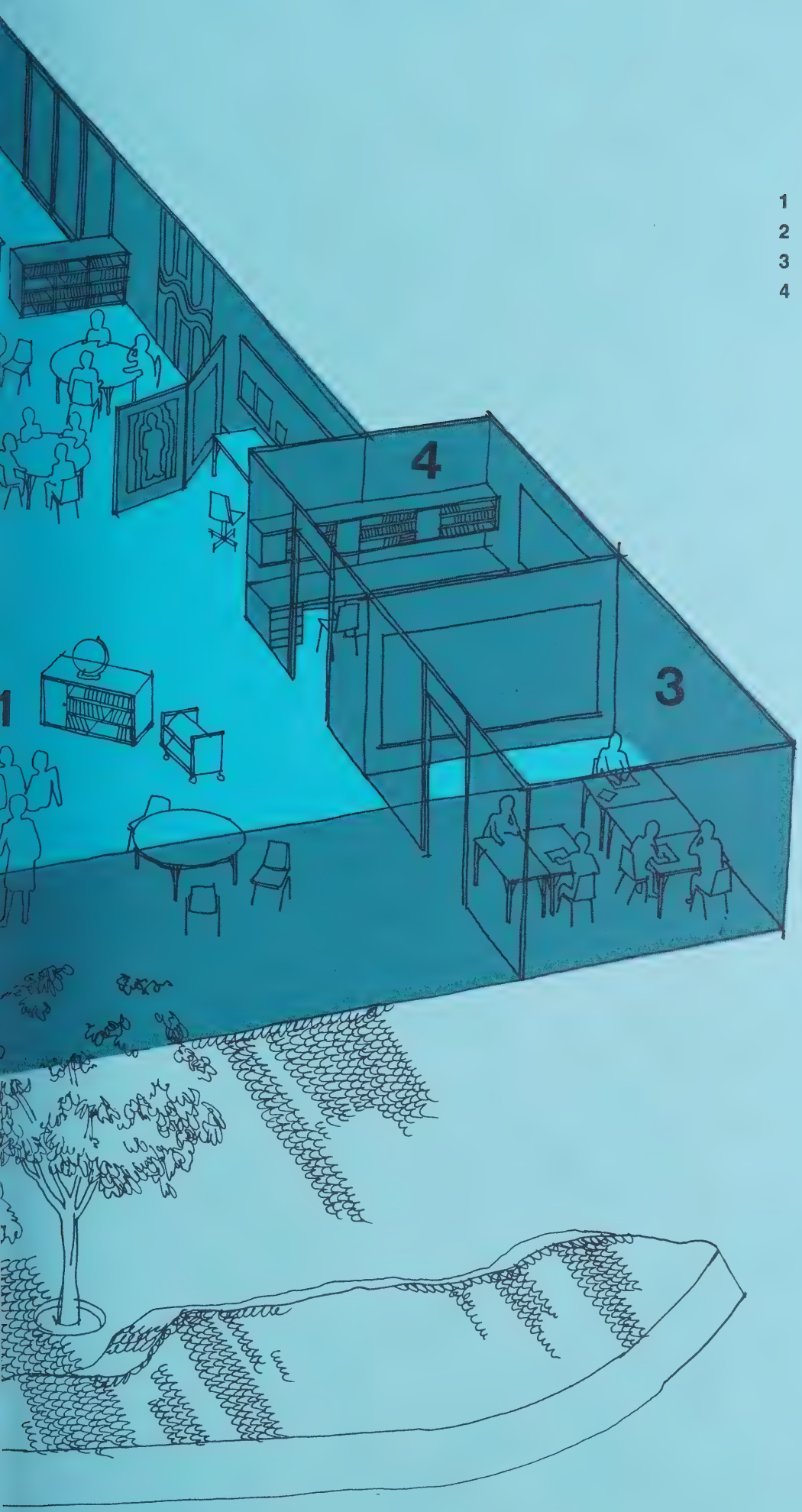




1 General Learning Area
2 Wet Area
3 Seminar Area
4 Teachers' Planning Area

Sketch 2





1 General Learning Area
2 Wet Area
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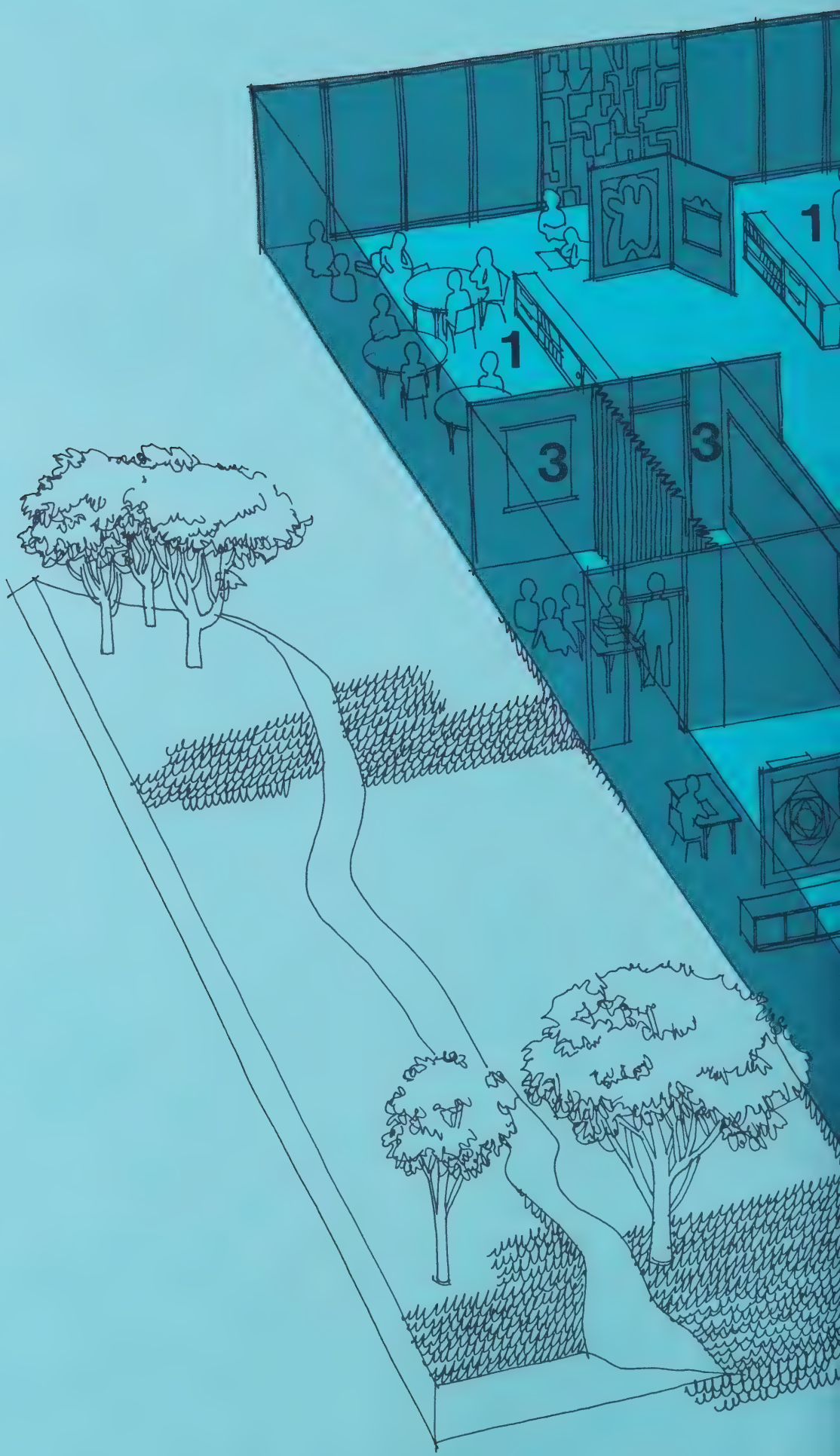
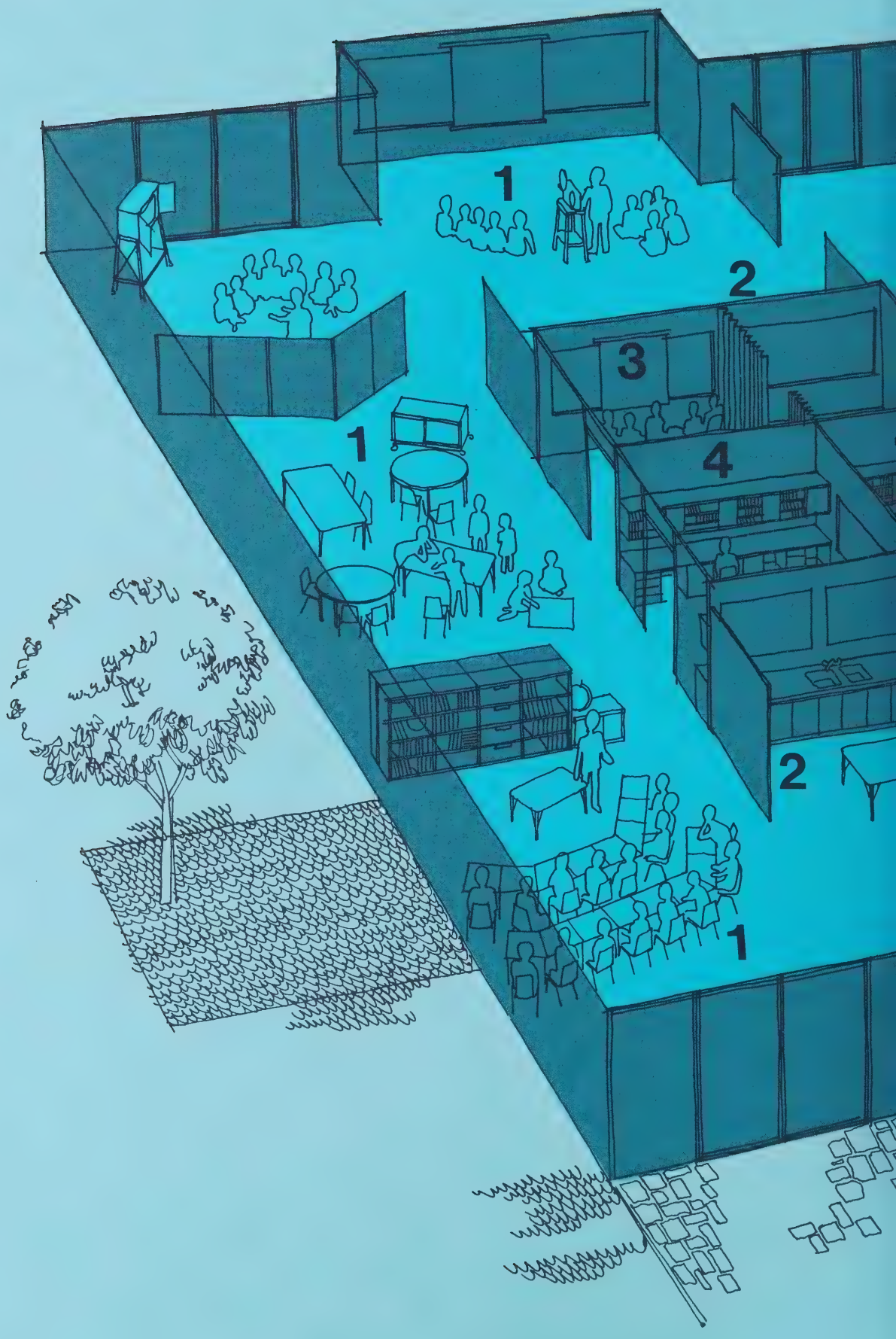
4 Teachers' Planning Area

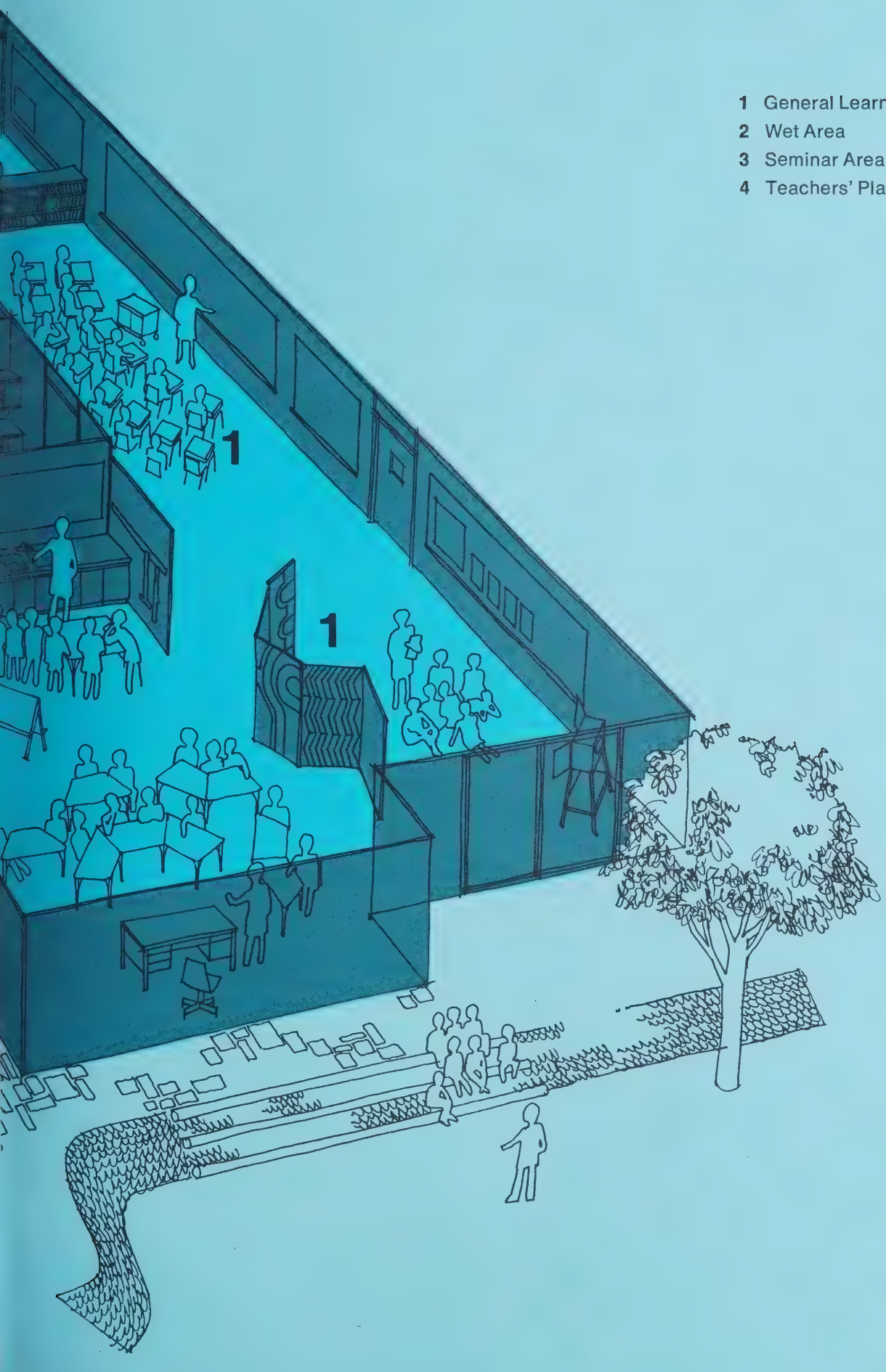
Sketch 3



1 General Learning Area
2 Wet Area
3 Seminar Area
4 Teachers' Planning Area

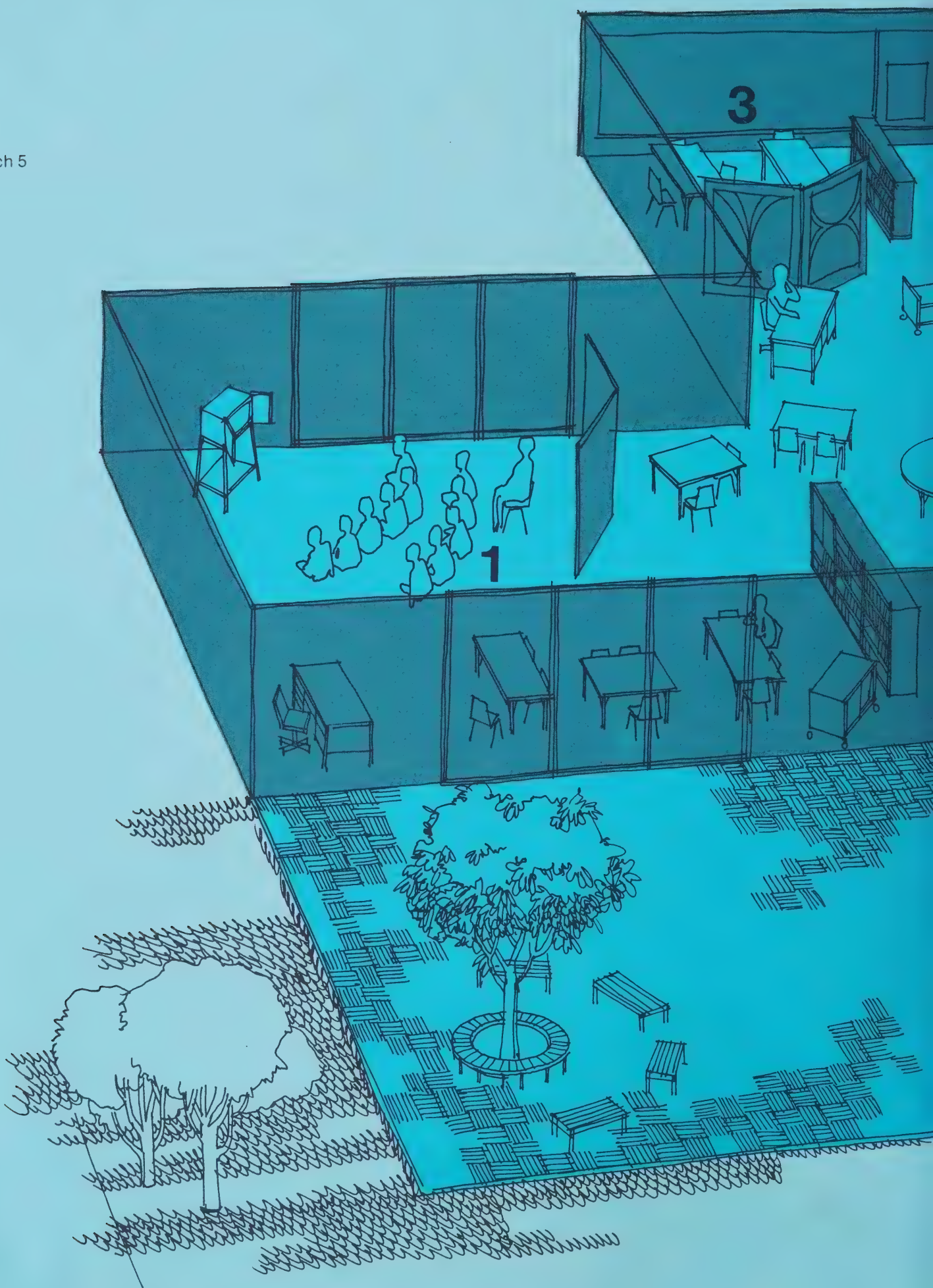
Sketch 4

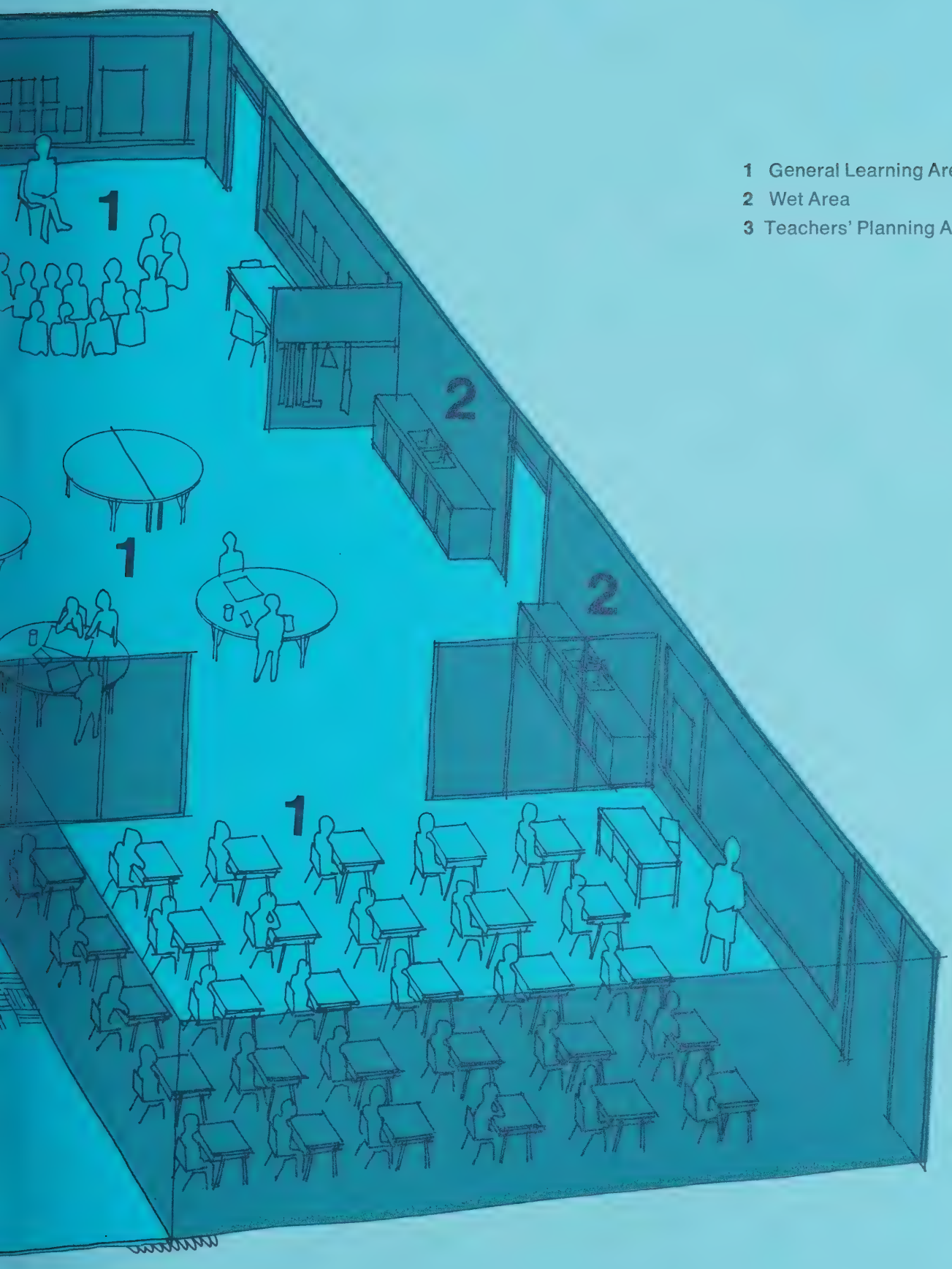




1 General Learning Area
2 Wet Area
3 Seminar Area
4 Teachers' Planning Area

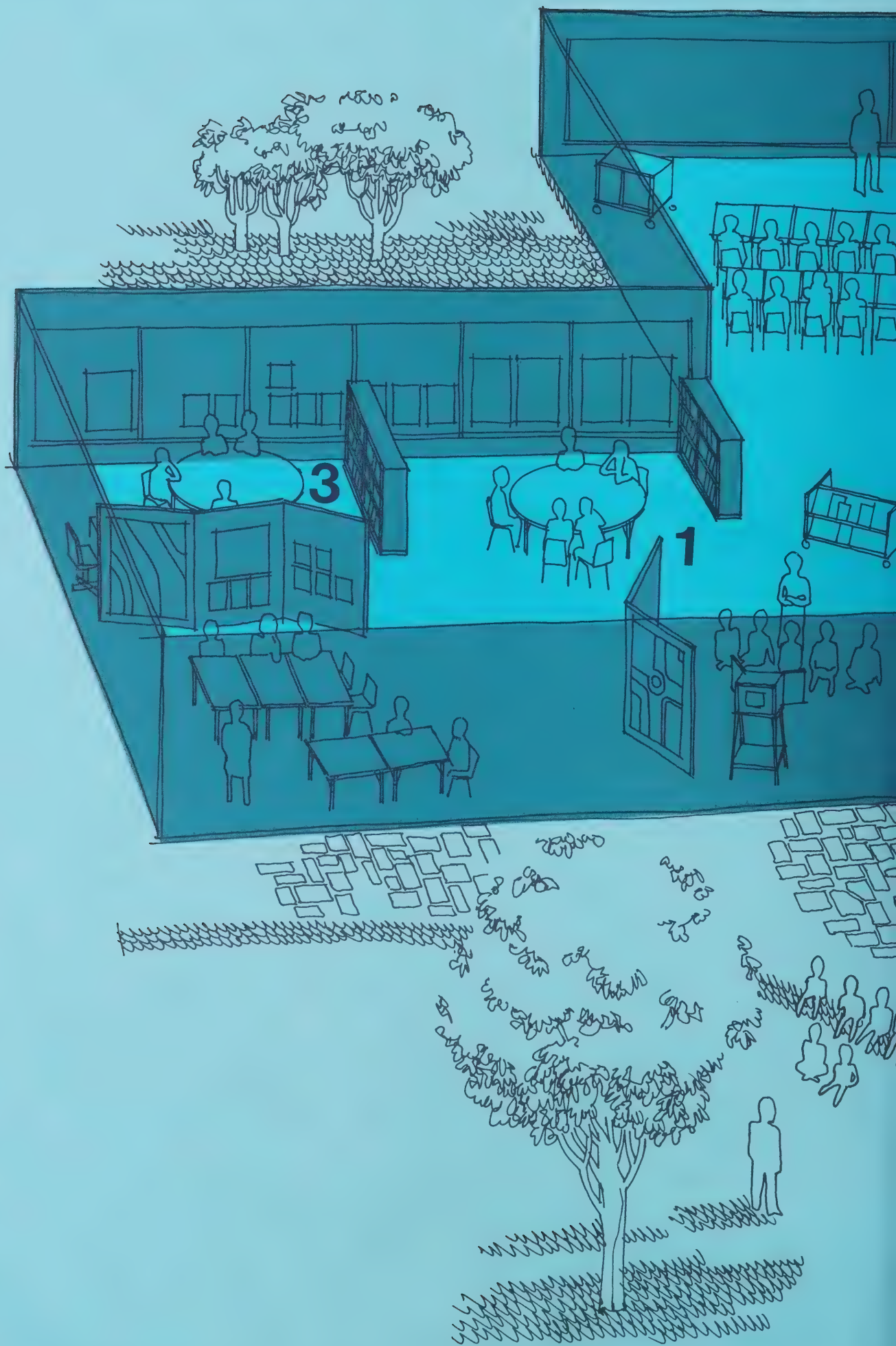
Sketch 5

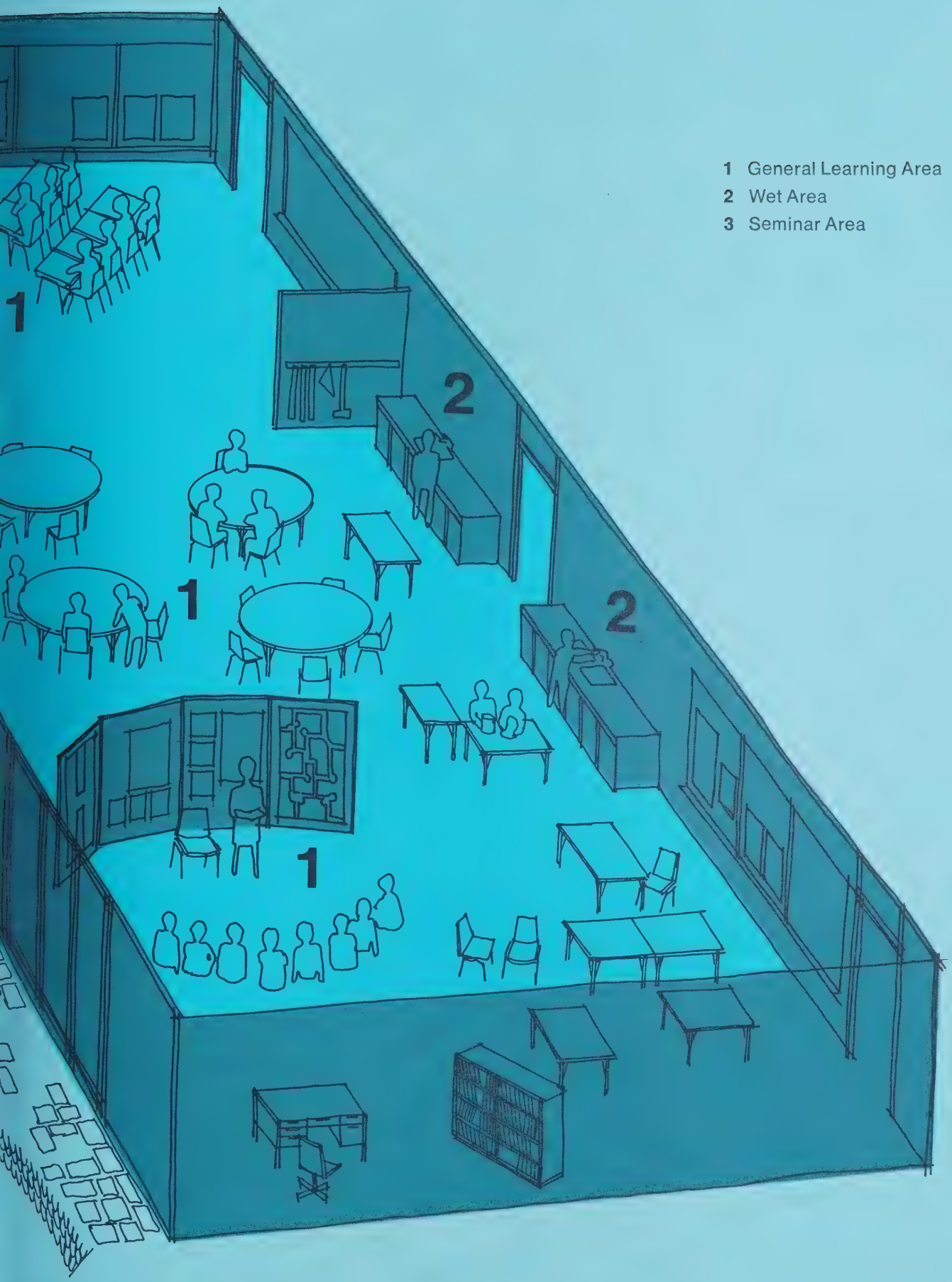




1 General Learning Area
2 Wet Area
3 Teachers' Planning Area

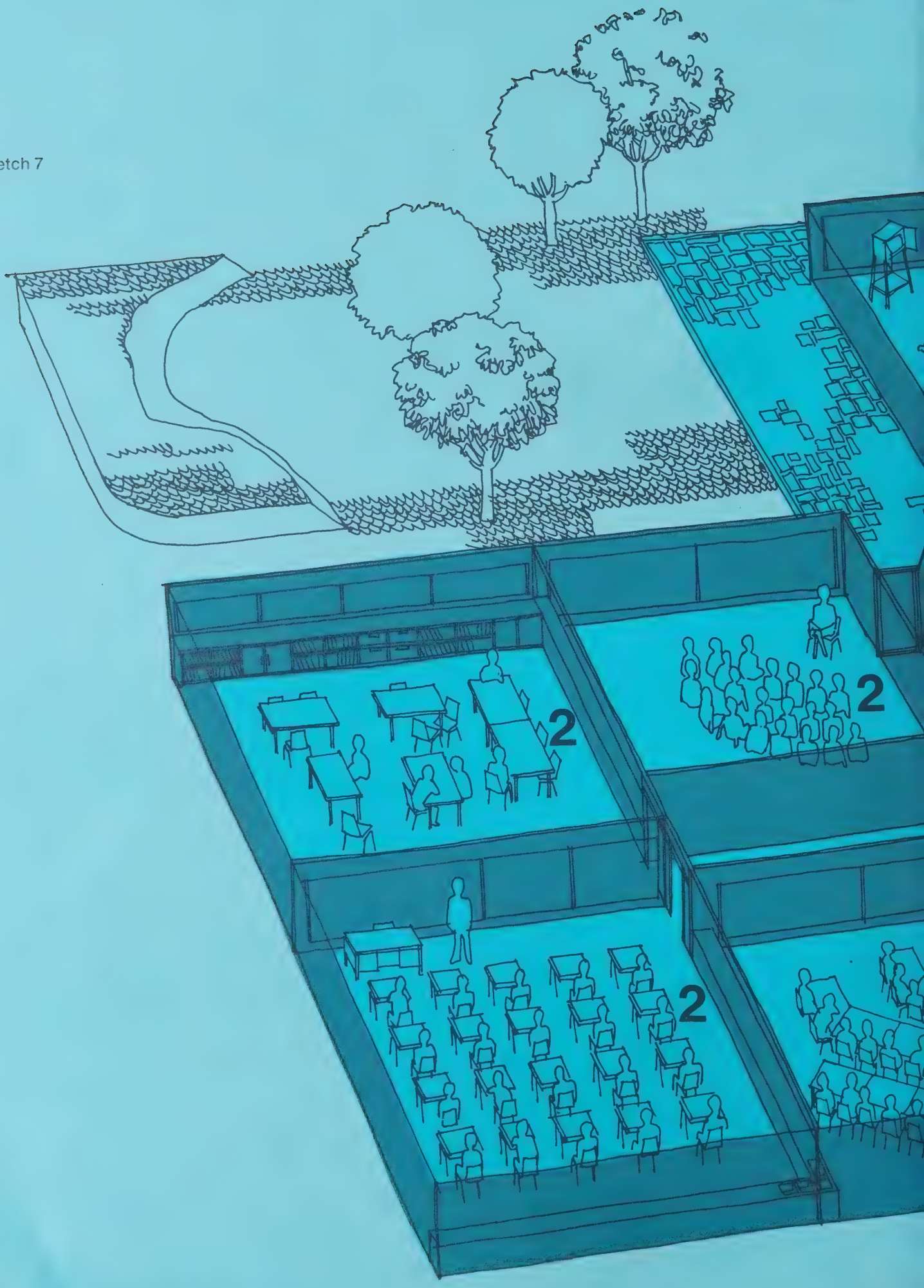
Sketch 6





1 General Learning Area
2 Wet Area
3 Seminar Area

Sketch 7



1 General Learning Area
2 Conventional Classroom
3 Teachers' Planning Area
4 Library Resource Centre

Acknowledgement
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